Croonian Lectures

ON THE

RÔLE OF FATS IN VITAL PHENOMENA.

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LECTURE I.*

PHYSIOLOGICAL SIGNIFICANCE OF FATS.

THE rôle assigned to fats in physiology is and has been for a long time threefold. In order of precedence determined by seniority these are: that they add beauty to the outline of the human form; that they serve as a protection for delicate organs against injury, and for the body as a whole against cold; and, finally, that they constitute the principal fund of reserve fuel on which the system can draw in times of shortage.

But there have long been indications that the physiology of fats could not be so quickly dismissed. The material that enters into the composition of an organism may be potentially fuel and yet actually something more. If the essential chemical constituent of living matter is protein, the protein of the muscles and of other organs that waste in starvation is clearly the material that supplies the nitrogenous needs of the heart that does not waste.

Is it possible that the fat that is found in the parenchymatous cells of the various organs, though it may at need serve as a source of potential energy, has other more essential functions to perform? Is it possible that any of it is actually, like the proteins themselves, needed for the very maintenance of the form of life, a part of the material that lives? For much the larger part of the fat that is found in the body this possibility is excluded. That is probably why this question is not more frequently put. The days when most of us come fresh to the study of physiology are half of them spent in cutting away fat in the dissecting-room as material that has no interest or significance. In adipose tissue the cells have relapsed into a state of ignoble obesity. They are merely receptacles of riches for others to prey upon. But organs and tissues may be practically free from adipose tissue and yet, when subjected to analysis, they are found to contain fat.

We have in physiology to define fat in our own way. The chemical definition of fat is too narrow. There are compounds of the higher fatty acids which in the narrower chemical sense may not be fats. But the physiological significance of fats resides so largely in the properties of the long chains of carbon atoms of the higher fatty acids that the physiology of fats rests upon the physical and chemical properties of these chains, and cannot be confined to their behaviour only when they are combined with glycerol alone as simple glycerides. Some of the fatty acid chains can only fulfil their physiological destiny by entering into combination, even if it is only temporarily, with other groups besides that of glycerol; and if they do they do not cease for the student of physiology to be fat. That is why in the estimation of fat in animal organs the method now generally adopted is to liberate the fatty acids from all the combinations in which they occur, determine their amount, and give the result in terms of fatty acid.

DIFFERENCES BETWEEN FAT IN ADIPOSE TISSUE AND IN ORGANS.

There are three points that the analysis of the fat in animal organs brings out which bear on the physiology of fats, three points of difference between such fat and that which is found in adipose tissue. In the first place the fatty acids, or some of them, are different; in the second the combinations in which they occur are, in part at least, different; and lastly, instead of varying in amount with accidental variations in the state of nutrition, they show a general tendency to remain constant around certain mean values.

Differences in Fatty Acids.

The fatty acids are different. In the adipose tissue of any species the fat has as a rule a certain constant composition, in which saturated and unsaturated acids occur in proportions that are more or less fixed. In different species these are different: lard, suet, tallow, goose-fat differ from one another, but each of them has constant properties, largely, though perhaps not solely, determined by the nature of the food taken by the species of animals in which it is deposited; and in any species the composition may be altered by alterations in the fat contained in the food. These differences in the fat of the adipose tissue are therefore accidental. Adipose tissue fat is, broadly speaking, the fat taken as food. But in the organs the fatty acids are no longer entirely the same; here too, it is true, saturated acids are found, but with them are associated unsaturated acids, other than oleic acid, which are not found in the adipose tissue, and must therefore have been produced in the body. This is shown by the amount of iodine absorbed by the acids which is, except occasionally in the liver, much greater, and shows a constancy that has a different significance from the accidental constancy of the fat of the connective tissue in this respect. Moreover, the acids themselves, or characteristic derivatives of them, can be isolated and identified.

Combinations of Fatty Acids.

The combinations in which the fatty acids occur are different, because a considerable amount of the fatty material is associated with phosphoric acid and groups containing nitrogen, and from the organs lecithine and other compounds of fatty acids which contain phosphorus and nitrogen can be obtained. Direct estimations of the amount of these combinations of fatty acids cannot be made. But the total fatty acids from all combinations having been determined, it is possible to determine the amount of phosphorus present in combinations which are soluble in solvents for fat, and from the proportion between the quantities found, on certain assumptions, inferences can be drawn. Lecithine and cephaline, for instance, yield two molecules of fatty acid for one atom of phosphorus. If the fatty acids have 18 carbon atoms this means that the amount of fatty acid obtainable from these compounds would be about 18 times as great as the amount of phosphorus they contain. If these are the only compounds occurring in an organ that contain phosphorus and dissolve in these solvents it is clear that determinations carried out on these lines tell us the extent to which the fat in an organ takes these forms.

This has been done more systematically in recent years by A. Mayer and Schaeffer,[1] and some of their results are given in Table I., which is from one of their papers.

TABLE I.—*Value of the Ratio of Total Fatty Acid to Phosphorus Extracted by Fat Solvents in the Organs. (In Lecithine and Cephaline this Ratio is 18.)*

—	Kidney.	Lung.	Pancreas.	Liver.	Serum.
In man (one case)	24·7	—	54·8	36·1	—
Dogs	22·1	22·4	27·0	21·4	23·5
Rabbit	22·0	25·3	—	19·6	13·6
Guinea-pig ..	24·9	18·8	—	16·0	23·5
Pigeon	26·6	16·5	—	32·6	23·0
					Fowl
Horse	—	—	—	20	23·0
Ox	—	—	—	29	23·5
Mouse	—	—	—	28	—
Sheep	—	—	—	—	23·1
Pig	—	—	—	—	23·2

It is clear that interpreting these figures on the implied assumptions we should arrive at the conclusion

* These lectures were prepared for delivery before the Royal College of Physicians of London in 1923. Lectures II., III., and IV. will appear in subsequent issues.

that considerably the major part, about three-quarters, of the fat in these organs in almost all cases was composed of compounds such as lecithine.

Constancy of the Amount of Fat in the Organs.

Lastly, while the total amount of fat in the body as a whole varies greatly because of the great variations in the amount stored in connective tissues in different states of nutrition, the amount in the organs is subject to variations which are, except in the liver, comparatively small. In the great majority of cases the fatty acids constitute between 2·5 and 4 per cent. of the weight of the organs, or between 10 and 16 per cent. of their dry weight. In the voluntary muscles the amount is sometimes more and the variations are greater. Whether the cause of this variability, so far as it affects the same muscle in the same species, is anything more than the result of the presence of more or less interstitial adipose tissue may be questioned. In the spleen the fatty acids generally amount to less than 10 per cent.

Upon the constancy of the amount of fat in the organs great stress has been laid by André Mayer, Terroine, and others associated with them; and the point which they have brought out which is of greatest significance is that the organs of animals starved to death contain substantially the same proportion of fat as those of animals that have been normally fed. This is a fact that has not generally been expected. When it is said that a starved animal will use up all the fat in its body before it dies, this applies properly only to the fat stored in the adipose tissue. In the organs it is impossible for the fat to be all used up; it is an essential part of the cell substance, and cannot be dispensed with any more than the proteins so long as the cell is alive.

The Cholesterol Content of Fats.

In addition to these three prime differences between the fat of adipose tissue and that found in the cell protoplasm of the organs that do the work of the body, there is a further point of difference the importance of which it is difficult to estimate. While the fat in connective tissues contains only barely detectable amounts of cholesterol, in the organs cholesterol is always present. It appears to be functionally, as well as in part chemically, associated with the fat. Cholesterol esters of fatty acids are found in the blood, in the adrenal gland, and in certain conditions in the kidney. In nervous tissue, which contains more cholesterol than any other, it is found to be chemically free; but it is there anatomically so intimately associated with fatty components that it is difficult to believe that it is not functionally, too, in the closest relationship with them. André Mayer has traced constant quantitative relations between the amount of cholesterol and the amount of fatty acids found in the various organs, which are shown in Table II. He particularly comments on the fact

TABLE II.—*Relation Between the Amount of Cholesterol Found in Various Organs and the Fatty Acids they Contain Expressed in Percentage of the Latter. (A. Mayer and Schaeffer.)*

—	Dog.	Rabbit	Pigeon	—	Dog.	Rabbit	Pigeon
Lung ..	20·0	17·1	24·1	Heart ..	4·3	—	—
Kidney	10·5	13·3	9·1	Testis ..	2·3	—	—
Liver ..	6·8	8·4	7·9	Muscle .	2·3	7·3	1·6

that the differences in this respect found in different organs are the same in the different species examined; in each species the ratio for any organ is remarkably constant, and for all species the ratios for the different organs come out in the same order. The lung gives the highest value, then the kidney and liver follow, and the lowest value falls to muscle. He regards the protoplasm of different types of cells as differing from one another much as do different alloys of the metals, the properties of each type depending upon the proportions in which the ingredients occur in it. In the neuron fatty components and cholesterol constitute nearly 10 per cent., in a liver cell 3 to 4 per cent., in a red blood corpuscle less than 1 per cent. There is more fat and more cholesterol in red muscle than there is in white, and still more in the heart. The relations between cholesterol and fatty acids appears, according to Mayer's observations, to determine the amount of water in proportion to solids held by a type of cell, and also the amount of water that any type of cell will take up when immersed in water. The water taken up varies, he finds, inversely with the amount of fat, and directly with the amount of cholesterol that the cells contain. Thus the lung takes up more water than the kidney, the kidney than the liver, and so on in order down the list shown in Table II. In the muscles which contain varying amounts of reserve fat which is not built up into the protoplasmic fabric, and differ in this respect from other organs, the amount of water taken up varies directly with the cholesterol and inversely with the phosphorus associated with fatty acids; so that they also come into line. In starvation the organs as they waste lose protein and fat in proportion, but appear to retain cholesterol, so that the ratio of cholesterol to fatty acid in the cell rises, and with this change the amount of water taken up by the cells when immersed in pure water is increased correspondingly. (Table III.)

TABLE III.

—	Cholesterol Fatty acid (per cent.).	Imbibition: g. H_2O taken up by the cells reckoned per 100 g. of solid contents.
Normal liver ..	8·4	509
Starved ,, ..	13·0	1133
Normal muscle ..	7·3	560
Starved ,, ..	9·0	917
,, ,, ..	15·7	1194

This puts the fats on a different level from that to which they have generally been assigned. Everyone has known that in starvation the brain and nervous system do not lose weight; that means, though it is not usually pointed out, that the organ which contains the largest amount of what may be called organised fat can dispense with none of it if it is to live. And while other organs may lose weight, 30 per cent. or more, the proteins in them appear to be sacrificed as readily as the fat. The original relation between fat and protein is found to have been preserved to the end, as if this relation were the very essence of the constitution of the cell; as if, if I may quote words I used some years ago, fats were as indispensably built into the most intimate organisation of living matter as proteins themselves.[2]

From time to time biologists have recalled to mind the remark of Hoppe Seyler, made in 1866, that lecithine and cholesterol occur in every animal and vegetable cell, as well as the observations of Hermann recorded in the same year that the aliphatic narcotics, alcohol, ether, chloroform, all of them liberate hæmoglobin from the blood corpuscles. This property he considered, like their narcotic action, to be the result of their solvent power for cholesterol and lecithine, substances which he had recently shown to be present in the corpuscles. You will remember that Hans Meyer in 1899, and about the same time Overton, were among those on whom these early observations were not lost. Meyer clearly lays it down that the action of the substances he investigated proved for him that fats enter into the chemical structure of the cells on which these substances act, and that in this structure they are the seat of its functions. Overton's conception of the lipoid cell membrane was recognised as coming very near the truth, though the expression that he gave to it has not been in that form generally acceptable.

CHEMISTRY OF FATTY COMPOUNDS.

One of the reasons why progress in this direction has been and is likely still to be slow is the extreme difficulty that is presented by the more complex compounds of fatty acids as subjects of study and investigation. An important step forward has, however, been made, inasmuch as their chemical nature has been cleared up. By the work of H. MacLean,[3] Parnas,[4] and most recently Levene,[5] it is possible to obtain lecithine pure. The difficulty experienced by earlier workers has been shown to be due in part to the association with it of cephaline, in which an organic primary amine takes the place of the quaternary choline in lecithine. Levene has also defined the constitution of the third phospholipine sphingomyeline. He has, moreover, given good reason for believing that these three are the only such compounds that exist. Sphingomyeline introduces, however, complications. Into its composition there enter groups which, while clearly related to the known fatty acids, are not so familiar as those in lecithine and cephaline. But these groups occur also associated with galactose, instead of phosphoric acid and choline, in the galactolipines or cerebrosides.

So far as the pure chemistry of these substances is concerned therefore, the first steps, those that cost most, have been taken and a secure foothold obtained. But if we provisionally take the position to which A. Mayer and Schaeffer have advanced, if we regard the fat in cells as no less concerned with the structural organisation of cell substance than the proteins themselves, does what we know at present help us to form clear ideas of the relationship in that structure between the different constituents? It must be admitted that it is not yet sufficient for that.

PHYSICAL STATE OF CELL FAT.

There are two commonly current conceptions of the physical state of the fat in cells, for each of which there is foundation in familiar facts. We are led by one group of facts to think of it as enclosed in the liquid cell substance, by another to think of it as surrounding this cell substance as it were in a membrane. Microscopic observations reveal fat in connective tissue corpuscles as a mass included in the cell, distending it so that it is merely a protoplasmic receptacle for oil. The signet ring cells seen occasionally in the liver are in a lesser degree essentially the same. In other cells it is not uncommon to see a number of smaller drops included in the cell fluid, which in optical behaviour, solubility, and staining properties are unmistakably drops of oil. In many more, some would say by generalisation in all normal cells, much finer particles, the mitochondria of Benda or granules of Altmann, are recognisable, and these, too, may be shown by their solubility and behaviour with fixing reagents and with dyes, though with somewhat more difficulty, to be also fatty in nature. Fauré-Fremiet and Mayer,[6] and Mayer, Rathery and Schaeffer [7] have shown that the granules in the kidney and liver behave with solvents and with oxidising fixative fluids as if they contained unsaturated fatty acids which oxidation converts into hydroxy acids.

Similar fatty inclusions have been brought into view in tissues such as the normal heart and voluntary muscle-fibres stained with Sudan III. after the use of similar fixing fluids (E. T. Bell, 1912)[8] and with alkaline Scharlach R. solution after fixing with neutral formalin (Hays Bullard, 1916).[9]

Beyond this state of subdivision and dispersion histology cannot follow the fat in cells. But it is a well-known fact that cells in which it is easy to detect by histological methods fatty material in comparatively gross droplets do not necessarily contain any more fat than those in which the ordinary technique fails to reveal any at all. In the normal heart of guinea-pigs no fat can be detected by a technique which 24 hours after a dose of diphtheria toxin shows the guinea-pig's heart to be loaded with fatty droplets, and yet such heart muscle may be shown to contain no more fat than the normal control.[10] The toxin has set up changes in the physical state of the fat for which the name phanerosis has been proposed: the fat has been unmasked.

In the blood plasma fat appears to be, in part at least, in a state of subdivision too fine to be revealed by anything but the ultra-microscope. Ultra-microscopic particles have been described which are present in the plasma of animals, during the absorption of fat and at times when, as during the later stages of pregnancy, the transport of fat from the connective tissues is active; these particles are not visible at other times.

In observations such as these we have a series of gradations in the size of the fatty inclusions in cell protoplasm ranging from a drop that usurps almost the whole volume of a bulging cell to particles many hundred times smaller, less than 1 μ in diameter, and even by inference to particles smaller still, too small to take stain, or at any rate too small to be seen if they do. But in all the fat is enclosed in the cell fluid, more or less dispersed, more or less aggregated in it. We are led to speak of protoplasm as an emulsion of oily material in a watery medium sometimes too fine to be recognised, at other times more coarsely aggregated.

CELL MEMBRANE AND ITS PERMEABILITY.

That is one group of facts. The other is less objectively obvious and more inferential. It has gathered round the original observation of Hermann that the red blood corpuscles contain lecithine and cholesterol, and that solvents for these substances cause the hæmoglobin to escape from the corpuscles. Hans Meyer and Overton added other observations already referred to, and for nearly a quarter of a century there has been current a conception of cell protoplasm as enclosed in a fatty pellicle or lipoid membrane, which is the exact converse of the one that we have just been following out.

That an envelope with remarkable tenacity invests the red blood corpuscle is almost irresistibly conveyed by the moving photographs taken by Krogh and reproduced in his book on the "Physiology of the Capillaries." A frog's blood corpuscle is shown caught on the edge of the bifurcation of a vessel, which it rides like a sack of meal hung across a fence; later it can be seen gradually slipping over on to one side and then resuming its normal shape as it passes on. Almost all the facts of hæmolysis seem to require for their interpretation the existence of such a sac. This and the familiar behaviour of the red blood corpuscle to ether, chloroform, bile salts, saponine and soap solutions is the real reason for the acceptability of the theory of the lipoid membrane. Overton added to these his contributions on the permeability of cells in general: the surface membrane, he argued, must be of some lipoid material since the substances that could penetrate it were those which were soluble in lipoids. Ammonia, urea, acids like acetic, and basic dyes penetrate the cell membrane, and they are soluble in benzene and in substances that are like lipoids in that they will dissolve them; whereas sodium, sugar, amino acids, inorganic acids and salts, and acid dyes, which are not soluble in benzene, do not either penetrate. Hans Meyer's observations on the narcotic action of a variety of unrelated compounds which he found exerted their narcotic action in proportion to their partition-coefficient as between oil and water, were correlated with Overton's and interpreted as confirming them. Substances that will pass from water into oil will penetrate a lipoid membrane, and because certain substances suspend the activity of cells in proportion as they pass from water to oil they must be able to reach the cell because its surface is composed of material akin to oil; that was the implied argument.

This argument has been subjected to much criticism. The case of the dyes was specially taken up by Loewe, who showed that the dyes which penetrated the cell were not really soluble in lipoids; the proportion in which they are taken up by lipoids from watery solutions does not vary directly with the concentration of the solutions; proportionally more is taken

up the weaker these are; in other words, it is not a case of partition between two rival solvents, but of adsorption, and if that is so a lipoid membrane would not account for the penetration of the dye into the enclosed aqueous protoplasm; it would, indeed, rather hinder it.

Moreover, the impermeablity of cells is not fixed and constant. For the life of cells it is essential that sugar, amino acids, even inorganic salts should be able to reach them. This is to some extent true even of the red blood corpuscle. A lipoid membrane characterised by unconditional impermeability to these substances would be fatal. Changes in permeability are in fact characteristic of the active cell. Excitation is accompanied by an increased permeability and the escape of ions which at other times are confined. The paralytic action of narcotic drugs is due to the fact that so far from increasing permeability, as solvents for a lipoid membrane would be expected to do, they diminish it. They paralyse because they prevent the increase of permeability that is inseparable from excitation. If they are present in fatal amounts then they do not merely narcotise the cell, but destroy all the properties alike which are characteristic of it when alive.

The lipoid membrane in the shape in which it was first propounded, perhaps in that in which it is still often thought of, is too crude to meet the requirements. Perhaps the simplest and not the least effective criticism of it is this. Almost every cell is and must be permeable to water: the lipoid membrane is by definition one that gives passage only to what is soluble in lipoids. It is difficult, of course, to say what is included and what is not included by the word lipoid, what the properties of lipoids are and what they are not. The term lipoid survives because it is convenient not to have to define it. Lipoids are apparently substances that have any of the properties of oil so long as they do not have them all. It may be unreasonable, therefore, to insist that the lipoid membrane ought to be impermeable to water; it is not unreasonable to expect some comment on the fact that it is always permeable to it. To say merely that the properties of lecithine are different from those of simple fats is not enough.

But the fact remains that the hæmoglobin is contained within the red blood corpuscle by something which behaves in many ways as if it were lipoid, had, that is to say, some of the properties of fat and not others. A considerable part of the stroma consists of lecithine at any rate, together with an amount of cholesterol that varies in different species of animals, and varies, too, directly with the power of resisting the lytic action of saponin against which cholesterol is known to give protection. The fact remains, too, that if these are the substances that contain the hæmoglobin within the corpuscle, lecithine and other compounds of fatty acids and also cholesterol are present in much larger quantities in other cells than in these, five or six times the amount, and that the permeability of other cells presents features of similarity with that of the red blood corpuscle. In fact the lipoid membrane remains, in some form.

FATTY AND OTHER CONSTITUENTS OF CELLS IN RELATION TO PROTOPLASMIC STRUCTURE.

These two contrasted groups of facts with regard to the physical relation of the fatty constituents of cell substance to the rest of its components, those pointing to the suspension of drops or droplets in a watery medium and those pointing to the cell contents being enclosed in a fatty pellicle, require to be brought into harmony with one another.

It is sometimes done in this way. Fatty substances sufficiently subdivided and dispersed in a watery medium are supposed to behave as if they formed a colloidal solution of the type described as emulsoid. It is characteristic of the most familiar of such solutions that they have a lower surface tension than the pure solvent, and that consequently the substance lowering surface tension is concentrated in the surface. All proteins so far as is known are concentrated in the surface of their solutions, in the case of some to such a degree as to form a coherent solid film there. It is accordingly common to suppose that fatty substances will be similarly concentrated in the surface of cells in which they are dispersed.

But an emulsoid solution according to the accepted idea consists of aggregates, which are so constructed as to contain some of the solvent, and which are dispersed in a continuum of the solvent containing some of the dispersed phase in true solution. The structure of the aggregates is not understood, but may be supposed to consist in the binding of molecules together by polar affinities in such a way as to leave interstices capable of accommodating relatively large quantities of water; a jelly may contain 98 per cent. of water. The solvent then permeates the interstices in these aggregates, where it must be supposed to be entangled so as to lose some of the freedom of an unencumbered liquid; but even in these interstices it is continuous with the surrounding body of fluid that has lost none of this freedom. This fluid outside the aggregates contains sparse molecules of the solute, which since they lower its surface tension tend to concentrate in the surface.

But fatty substances are immiscible with water. Emulsions of immiscible liquids are not the same as emulsoid solutions. They behave rather as suspensions of insoluble solids. The fact that two liquids are immiscible precludes the possibility of molecular dispersion. If a colloidal solution of one in the other is obtained that solution must be of the nature of a suspension, a suspensoid colloidal solution, quite different from the "hydrophile" emulsoid system. Moreover, the dispersion will be unstable and the droplets will tend to coalesce and run together; because whenever they come within a certain distance of one another, less than the diameter of the sphere of molecular attractions between the molecules of the solvent, the cohesive forces among these latter molecules will drive the globules into one another by pulling the solvent aside from between them. Such emulsions are stable only if there is some substance dissolved in the solvent that lowers its surface tension and concentrates on the interface. For two droplets of the emulsified liquid then to coalesce, the interfacial area must be diminished and some of the adsorbed molecules be driven back into the solution, and that is resisted by the cohesive forces between the molecules of the solvent.

It is true that fat droplets, as any foreign bodies or molecules which attract and are attracted by the molecules of water less than the molecules of water attract each other, will tend to be squeezed out on to the surface whenever they come within a certain distance of it, a distance less than the radius of the sphere of attractions between water molecules.

But to explain the formation of the membranes investing cells in this way is almost like supposing that the sea is kept within its bounds by the driftwood it washes up on to the shore. That which invests the surface of cells is too highly organised, has properties of specific permeability and impermeability far too delicately balanced to be the product merely of undiscriminating processes such as these. Moreover, a cell is an aqueous system surrounded by an aqueous system; to suppose that the limiting membrane is formed by adsorption at the interface begs the question; there is no continuous interface till the formation of a coherent membrane brings it into existence.

There is another way in which the coexistence of continuous membranes and dispersed aggregates may be understood which is based upon the observation of Bancroft and of Clowes.[11] Oil is easily emulsified in an aqueous solution of alkaline soaps. If these soaps are converted into the calcium soaps, which are insoluble in the water, but soluble in the oil, the drops of oil join up to form continuous layers enclosing the water. What was the dispersed phase becomes the continuous one, and vice versa. By inversion of phases the emulsion becomes one of

water in oil. It is thought that in the unhomogeneous system of the cell there may be at the surface an emulsion of this description, of water in oil in some parts or at some times, and in other parts or at other times possibly one of oil in water.

Some shadow of support for such a conception is perhaps suggested by the well-known facts as to the influence of calcium and of sodium on the permeability of cells. A tissue of cells has a low conductivity for electric currents. The ions that could conduct are confined within the impermeable cell membranes and by this restriction of their movements are prevented from conducting the current. For this normal impermeable condition of membranes calcium has to be present; the same tissue acquires the power of conducting, allows, that is, freer passage to the ions, when by means of solutions of sodium salts free from calcium the normal proportion between sodium and calcium ions in the surface is disturbed; and the normal state of the surface membrane can then be restored when a proper proportion of calcium is added to the solution.

As a result of this review of current conceptions as to the relation between the fatty and other constituents of cells in the structure of their protoplasm, I think it must be admitted that there is room for further work and for data obtained in other ways. Some such data have begun to be available, and I propose to inquire how far they may be helpful.

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An Address
ON
ARTHRITIS IN CHILDHOOD.

Delivered at the Children's Hospital, Feb. 26th, 1925,

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ARTHRITIS occurring in childhood presents various aspects of interest, and is an admirable introduction to the more complex problem of arthritis in adult life. We must recognise that the joints reach great perfection in childhood, and no one can see their wonderful mobility and, if middle-aged, recognise the loss of that advantage without being convinced of this fact. High efficiency means healthy structure, and this in turn is usually resistant to disease. Be that as it may, in this hospital, apart from tuberculosis, a severe arthritis is comparatively infrequent, and those who have studied it at all ages must be struck by the absence in the young of those degenerative factors which make this condition in the elderly often so crippling, as is exemplified by osteo-arthritis of the hip-joint.

In adult life we are continually in perplexity as to how much importance should be attached to metabolic faults, nerve degeneration, and traumatic factors. On the other hand, in both young and old, the "local focus" is now to the fore, but it is remarkable how often in adult rheumatoid arthritis we fail to detect any convincing evidence of a local focus, however much we may suspect its presence.

In childhood, with few exceptions, we can clearly trace the factor of infection. It is sufficient for me to recall to memory tuberculous, rheumatic, syphilitic, and gonococcal arthritis, influenzal, pneumococcal, meningococcal, and typhoid arthritis, and the septic staphylococcal and streptococcal forms. There are, nevertheless, as in the adult some mysterious cases, variously termed Still's disease or rheumatoid arthritis, and some remarkable examples of osteo-arthritis. But we cannot but feel, when we consider the cases of Still's disease, that they must also be infective in origin when we recall the fever, the enlarged glands and spleen, the sweating, and general toxæmia.

From this broad survey we learn some useful lessons. Almost every example I have just quoted is an instance of one manifestation of a general disease, and if we can hope to solve such a problem as the pathology of arthritis it must be from a study of all the other manifestations of these causal diseases, any one of which may throw a side light on the difficulties of the particular symptom "arthritis." This warns us against a too narrow specialism. Then, seeing the importance of infection in the arthritis of childhood, we can in these young children learn much about the results of such infections without complicating our survey, as in the adult, with degenerative and other secondary factors. Though, however, we must be on guard against too narrow a specialism, there can be no doubt that the detailed study of the structures involved in an arthritis is essential. This will include the synovial membranes, the cartilages, the bones, ligaments and capsules, the circulation and nervous supply, the tendons, bursæ, and the skin itself. In the child, too, we must remember also the epiphyses, for otherwise we may mistake an osteo-myelitis for a primary arthritis.

I will give some illustrations of the importance of this detailed study. A child may suffer much pain with no obvious swelling of the joints, the cause lying in the tendons around or in the nerves supplying the articulation; this is not infrequent in acute rheumatism. On the other hand, we sometimes find in acute rheumatism both knee-joints distended with fluid, and yet the child does not complain of pain. In other cases spasm of the powerful hamstring muscles may produce in the course of a stubborn but not necessarily crippling arthritis of the knee-joint early flexion. Almost before we are alive to the danger we may find ourselves confronted with the problem of correcting this flexion, for otherwise there will follow adhesions, and then the child will have to endure the trial of such painful manipulations as may be necessary to break them down. In the destructive forms of arthritis the erosion of the internal ligaments of the knee-joints may lead to backward dislocation or, more distressing still, insufficient care with manipulative movements may precipitate this result by actually tearing them. I need not dwell upon the recognition of "starting" pains, or the presence of abscesses in connexion with the joints. There are also rare and curious cases of chronic arthritis associated with sclerodermia, in which the closest attention has to be directed to the skin over the affected elbow-joints, which may become as thin as tissue-paper, and then liable to ulcerate and cause troublesome sores.

TUBERCULOUS ARTHRITIS.

It would be unnecessary for me to give a description of the classical tuberculous arthritis, but I will touch upon some of the more unusual results.

Poncet, in 1897, described a "tuberculous rheumatism," meaning by this an arthritis which closely resembled in its features rheumatoid arthritis.

Since the date of that paper I have been always on the watch for such cases. That acute tuberculous polyarthritis may occur in children is certain, and you may easily mistake it for acute rheumatism, but as I have seen on more than one occasion the child may die of tuberculous meningitis. It has been suggested that the chronic arthritis of the Still type is tuberculous, but all our evidence here I believe, including the necropsies, appears to negative this, and in the considerable number that I have seen I have never detected a tuberculous origin. The tuberculous rheumatism described by Poncet accordingly appears to be a rare occurrence, though I am quite prepared to admit that this is only a local experience. Dr. L. Findlay, in 1920, published three cases, one of them dying of tuberculous meningitis.[1] Mr. Lusné reported in Paris a case of an infant of 13 months with rheumatoid arthritis and a positive von Pirquet reaction, who died at the age of 3 years from tuberculous meningitis, and both of whose parents were consumptive. Accordingly at present I keep an open mind upon the frequency of "tuberculous rheumatism."

If "tuberculous arthritis" may be mistaken for the rheumatic, so sometimes may the rheumatic be mistaken for the tuberculous. I have seen a boy who had been put on his back in a Phelps's box for two years on account of a suspected spinal caries. It was, as a matter of fact, a rheumatic arthritis of the cervical spine. Although he had been kept at complete rest during this time he suffered from two attacks of rheumatic heart disease, the second being a severe pericarditis with much valvular damage. A rheumatic stiff neck may give trouble for weeks, although we associate it as a rule with a sudden onset, much pain, and swift recovery.

STILL'S DISEASE.

I come next to Still's disease, and call it by that name because I think it will define the particular group as it was first described by my colleague. I was fortunate to see many of the original cases upon which his classical paper was based.

The chief characteristics are: (1) An onset which is almost always before the second dentition. (2) The female sex is more often affected than the male. (3) The cause is unknown. One factor which has attracted me is the fact that several of my cases have come from low-lying and damp situations. (4) The articulations, apart from the thickened and vascular synovial membranes and ligaments, show little change. In some long-standing cases the synovial membrane has eroded small pits in the periphery of the cartilages, and there may be some fibrous adhesions, but there are no osteophytes, and there is no eburnation of the bones. The pitting of the cartilage by adherence of the synovial membranes resembles precisely the condition I have seen in experimental arthritis produced by the intravenous injection of streptococci. (5) The lymphatic glands and spleen, which are enlarged, show little change in structure, though there may be small hæmorrhages.

I have myself only seen one case from its very commencement, and I give a few details of this illness because they are of interest.

L. B. M. was admitted on August 2nd, 1923, for difficulty of breathing and pains all over the body which, with fever, had been present for three weeks. There were also night sweats and anorexia, and swelling of the wrist-joints. There was no family history of rheumatism. The child was pale and fretful. The lymphatic glands and spleen were palpable, the wrist-joints were swollen, and the temperature 100° F. The heart was enlarged, but there was no valvular disease. The count of the white blood-corpuscles was 75,800 per c.mm. The temperature remained raised for two months, and the feet and ankles became affected; later the knees also became swollen and the neck very stiff. In January, 1924, he had some bronchitis.

One can hardly doubt that this must have been an infective process, and the quick breathing at first raised the suspicion of broncho-pneumonia, but this never developed.

As a rule the onset of the disease is gradual, with stiffness of some of the joints as an early symptom. The knees, the wrists, and the cervical spine are first affected, and the changes involve the capsules of the joints and not the bones; and there is but little fluid exudation and that viscous and clear. The hands and fingers are soon implicated, and the ankles and feet may also soon be attacked. The child has outbursts of pain such as occur in the rheumatoid arthritis of adults. This disease is polyarticular and remarkably symmetrical in its distribution, with great tendency to early contractures and rigidity. The lymphatic glands are enlarged in association with the joints that are affected; they are not, as a rule, tender and never suppurate, but they may reach a considerable size, and even in some cases can be demonstrated in a photograph. The spleen may extend one or two inches below the costal arch but, as it tends to shrink again in the quiescent stage, this enlargement must be sought for during the more acute phase. Valvular lesions are not found, but in a few cases a film-like pericarditis and pleurisy have been discovered after death. There may be some exophthalmos and occasionally jaundice, and the temperature in severe cases is high and swinging between 100° and 104° F., and then the child may have severe sweatings and be extremely ill.

One of the most distressing features is the painful stiffness of the neck; as a result of this there may be noticed a striking over-action of the frontalis muscle when the child looks upwards. The course of the disease is marked by periodical outbursts of activity. Some of these children have bad teeth, others nasal discharges, but although treatment for such should at once be carried out I must confess that I have seen little direct result from these steps.

In common with other observers I have met with a considerable number of cases that do not coincide with the classical description, but which nevertheless show certain features that lead one to include them in this group. Some of these have been remarkable, and one in particular impressed itself on my memory.

This was a boy who showed an arthritis and fever with enlarged glands, but no splenic enlargement was discovered. The course of the disease in hospital was so disastrous that the parents removed the boy in disgust. For a year I saw nothing of him, but one day the father brought him up to my out-patient department. He had made a marvellous recovery, although his knees, elbows, and neck were stiff. This improvement had commenced about three months after leaving the hospital, and the only medical treatment had been cod-liver oil. I saw him once more six months later when he was again very ill. His chin now nearly touched his sternum and this is the remarkable feature: his heart was greatly enlarged, and there was a loud systolic mitral murmur and an enlarged liver with dropsy and pulmonary œdema. His parents would not leave him, and I had little doubt he died from cardiac failure, but the war supervening I lost sight of him.

Other cases in turn may show no enlargement of the glands, but the arthritic condition resembles that of Still's disease. I have made, over a good many years, with skilled assistance bacteriological examinations of several of these cases. The arthritic exudations, the blood, and in some cases the lymphatic glands, have been removed during life. The results have either been negative or, if micrococci had been isolated, they have not been demonstrated, or reproduced the disease. The fluid obtained from such joints has been in my cases scanty and viscous. The lymphatic glands, as we must remember, are not destroyed by the disease, and one suspects that the infective agent if it is present in them is taken up by the tissue cells, and one feels that unless an exactly suitable culture medium were used that they would be unlikely to survive their transference to the altered surroundings. All the examinations of the blood have been negative, though there may be an increase in the number of polymorphonuclear leucocytes.

[1] L. Findlay: Glasgow Med. Jour., 1920, i., 241.

OSTEO-ARTHRITIS.

Osteo-arthritis in childhood—by which I mean a chronic arthritis with hypertrophic changes in the synovial membranes, ulceration of the cartilages and osteophytic formation leading to bony thickenings and out-growth—is a very rare occurrence in the hospital, and, though of much interest, a subject upon which it is difficult to obtain information. In adult life it is the general experience that this form of arthritis usually commences later than the rheumatoid, and if we couple this with its apparent rarity in childhood it leads one to suspect that degenerative changes must be a factor in its development.

One of the most instructive cases of this type was shown by Mr. P. Turner in 1908 at the Society of Study for Disease of Children.

This was a girl of 10, both of whose knee-joints were distended with fluid, and thickened synovial membrane which, on each side of the patella, could be rolled under the fingers. There was slight grating on flexion of the knee-joints, and the ends of the bones appeared to be thickened. The wrist-joints and the first interphalangeal joints were also affected. There was this unusual feature, the absence of pain. That the lesions were osteo-arthritic in type was undoubted, but it was not absolutely clear that the cause was not syphilitic or tuberculous.

In my experience it is not a very rare event in a severe chronic arthritis in childhood to find spindle-shaped swelling of the fingers, Heberden's nodes, and some grating on movement of the interphalangeal joints. In 1919 Dr. R. Armstrong described such an occurrence in a boy of 12 years and his sister of 11. In the boy's case the illness had commenced at 4 years of age, and in 1918 there was a rheumatic attack with swelling of the ankles and knees. Dr. Armstrong had plotted out a pedigree showing the familial nature of this disorder, and as no local focus was apparent inclined to the explanation of the condition as one of a pure degeneration. Others were in agreement with him, but I am not yet prepared to go further than to accept a tissue tendency to some rheumatic infection. When you recall what I have already said of osteo-arthritis in the adult you will appreciate the interest there is in finding the term "degeneration" appearing in the pathology of the condition in childhood.

Mr. L. Barrington-Ward, in THE LANCET (1912, i., 157) under the title of Double Coxa Vara with other Deformities occurring in brother and sister, described two remarkable cases which I had seen myself on one occasion. The diagnosis raised such questions as Still's disease, osteo-arthritis, congenital syphilis, achondroplasia, and congenital abnormalities.

PNEUMOCOCCAL ARTHRITIS.

Passing now to pneumococcal arthritis, this again would appear to be in our medical wards a very rare event, and perhaps this is somewhat surprising, for about 70 per cent. of such cases are associated with pneumonia. It is needless to say that we get many cases of pneumonia and broncho-pneumonia, and we also get empyema and more rarely suppurative meningitis and pericarditis of pneumococcal origin. If we had cases of suppurative and non-suppurative arthritis complicating our cases of pneumonia I believe we should note them. Yet I cannot recall one case during my five years' tenure of the wards. That some of the mysterious cases of arthritis I have associated in my mind with Still's disease were due to pneumococcal infection is possible, but none of them has been ushered in to my knowledge by a frank pneumonia. As I shall mention later, there have been five examples of this arthritis occurring in surgical wards which have been accurately determined by culture. Three of these occurred in infancy, but none commenced with a pneumonia but appeared to be incidents in a general infection. As a rule one joint is attacked, and the order of frequency is the knee, the shoulder, the hip, the wrist, the ankle, the elbow, and the sterno-clavicular joint. The proportion of suppurative to serous cases is about 10 to 1.

Dr. Cave, of Bath, was the first in this country to demonstrate the exact nature of this form of arthritis, and his paper interested me at that time (1901) because then, when working at rheumatism Dr. A. Paine had isolated the pneumococcus from a doubtful case of arthritis, and this enabled us to recognise at once the importance of Dr. Cave's observations.

BACTERIOLOGICAL INVESTIGATIONS OF ARTHRITIS.

By Dr. D. NABARRO.

At this point it will be convenient to give some interesting details on the bacteriology of arthritis, for which I am indebted to Dr. Nabarro from the Research Department of the Hospital for Sick Children. They are concerned with the result of the examination of the exudations obtained from the joints of 108 cases of arthritis between 1917 and 1924.

In 54 of these the tubercle bacillus was found, or the case on clinical and cytological grounds was most probably tuberculous. Fifty-four were non-tuberculous.

In 21, streptococci were isolated and grown.
" 11, staphylococci " " "
" 11, the exudation was sterile.
" 5, the pneumococcus was isolated and grown.
" 3, the influenza bacillus " " "
" 1, staphylococci and streptococci were isolated and grown.
" 1, the *Staphylococcus albus* and *citreus* were found.
" 1, a Gram-negative bacillus (unidentified) was found.

You will see from these numbers—only five examples in seven years—how rarely the pneumococcus has been isolated from the joints of children under 12 years. That there have been some examples in which examination was not made is quite possible.

The age incidence of the non-tuberculous cases was as follows. There were 49 records, some of the 54 cases having been twice investigated.

17	were under the age of 1 years.				
8	were from	1 to	2	years of age.	
3	"	" 2 to	3	"	"
2	"	" 3 to	4	"	"
4	"	" 4 to	5	"	"
5	"	" 5 to	6	"	"
3	"	" 6 to	7	"	"
5	"	" 7 to	8	"	"
0	"	" 8 to	9	"	"
1	"	" 9 to	10	"	"
1	"	" 10 to	11	"	"
0	"	" 11 to	12	"	"

More than half these cases, it will be seen, were under 2 years of age. Eleven were streptococcal and five staphylococcal, three pneumococcal, three influenzal, two were sterile, and one was possibly gonococcal, but the report was doubtful. It is interesting to find that there was not a single case of meningococcal arthritis.

GONOCOCCAL ARTHRITIS.

Gonococcal arthritis is a very rare experience here, and only one doubtful case is recorded by Dr. Nabarro. Clement Lucas, in 1885, described its occurrence in infancy in a case which was of considerable interest, because then the bacteriological features were not known. Nevertheless the case was a convincing one because the mother had been infected 14 days before confinement, and there was acute vaginitis. Her husband was under treatment at the time. The infant on the second day had severe conjunctivitis, and about the fourteenth day developed arthritis of the left knee and the left wrist. The ophthalmia was treated and the arthritis gradually subsided under treatment which was of the simplest. Without the application of a splint or giving of medicine a cooling lotion was sufficient to bring about a good recovery.

CONGENITAL SYPHILIS.

As is well known, congenital syphilis frequently affects the bones and cartilages and may also cause arthritis. The osteo-periostitis of infancy (one of the causes of pseudo-paralysis) is essentially an epiphysitis with periostitis of varying degree. Radiography demonstrates these lesions very clearly. The

joints themselves in the neighbourhood of the epiphyses may be implicated and the synovial membranes swollen.

Equally characteristic, but not so often seen here, is the arthritis that occurs in older children. This we associate with such other late congenital lesions as Hutchinson's teeth, interstitial keratitis, and deafness. In some cases there may be an acute synovitis with fever, pain, and swelling; in other cases an osteo-arthritis with destruction of cartilage and bone, and the formation of osteophytes. The best defined cases are those in which both knee-joints are attacked and show large, puffy, almost painless swellings which fail to react to any treatment until the true cause is discovered. The diagnosis from tuberculous arthritis may be difficult, but the other stigmata of the disease and the blood reaction usually give the key to the solution.

INFLUENZAL ARTHRITIS.

As recently as October, 1924, Dr. Nabarro and Mr. J. F. H. Stallman[2] published a record of three cases of influenzal arthritis occurring in infancy. To those who are interested in the arthritis of adult life these exact records must be valuable, for they will recall how often in cases of rheumatoid arthritis a serious advance in the disease may follow an attack of severe influenza. Here we have proof that the influenzal infection itself may attack the joints of children. In these three infants the arthritis affected in each case the knee-joint. The exudations were purulent and the Gram-negative bacilli were present in numbers and were both extra- and intra-cellular. Two of the cases recovered and the final results were good. One died of influenzal meningitis, but the arthritis in this case also was running a favourable course. The writers, however, point out that in some of the recorded cases there has been total disorganisation of the joints affected. The treatment of these three cases was surgical.

ARTHRITIS AND MUMPS.

From time to time when investigating the history of acute rheumatism in childhood I have come upon a certain number of cases of heart disease which have been dated from an attack of mumps. I have never had the opportunity of tracing the development of this heart disease, and though I have heard of cases of arthritis following mumps I have never actually seen the condition. However, in THE LANCET of Jan. 10th, 1925, p. 86, there is an abstract from a thesis by Dr. P. Maisondieu upon this subject. He calculates the frequency of its occurrence at just under 0·5 per cent. It is usually a late manifestation, commencing about 14 days after the disappearance of the parotitis, and it may synchronise with an attack of orchitis. The distribution is as a rule monarticular, thence spreading sometimes from one joint to another. There may be much pain and swelling, or again there may be pain in several joints but no swelling. Suppuration is the exception. The temperature may be slightly raised and the duration of a prolonged attack extend over five or six weeks.

HÆMOPHILIC ARTHRITIS.

Hæmophilic arthritis is very uncommon in the medical wards, but I have seen a few severe examples and they present some striking features. One of the most obvious is the acute onset with intense pain; another is the remarkable recovery that may occur in the joints, which again and again seem as it were to rebound from the sudden injury to their structure. Nevertheless we find that there will eventually arise an increasing disability, at first from stiffness, later from more serious damage of the type of an osteo-arthritis as many years ago Sir Anthony Bowlby pointed out to us. The knees are the joints most often attacked and eventually severe crippling and ankylosis result.

[2] THE LANCET, 1924, ii., 743.

Another interesting point is the periodicity of the attacks. Possibly you may be under the impression that the hæmorrhages in these cases are invariably the result of some injury. We must admit that it is difficult to exclude this possibility, but the strange feature is that a definite injury may at one time of the year produce no effect, when at another, as a result of the slightest slip or twist or indeed without any remembered event of this kind, a severe effusion may develop. This is one of the terrors of the disease, for the patient lives as it were with the sword of Damocles suspended over his head. Parents will tell you of certain warnings which show that the mysterious change in the blood is developing; they will tell you of nervousness, irritability, and languor, of headaches, and even of uncomfortable sensations of tenseness in the joints. It is remarkable in the history of blood disorders how often we meet with this periodicity, and you need only recall the rise and wane of leukæmias, of lymphadenoma, of anæmia gravis, and purpura hæmorrhagica as striking instances. The occurrence of high fever and pericarditis during one of these attacks as I have seen leads one to speculate whether an infection, possibly even that of an ordinary cold, may not originate these hæmorrhages by producing the mysterious change in the blood which causes the bleeding.

As a rule the diagnosis is not difficult, for we have so frequently a previous history of bleeding either in the patient or in his forbears, and the intense rapidity of the onset, the pain, and the discoloration of the skin round the joint usually also guide us aright.

The treatment is difficult, and many remedies have been used. Calcium lactate combined with magnesium carbonate in 20 gr. doses are sometimes given an hour before meals. Dr. Lovell Gulland has found fresh serum most useful. Horse serum may be used either by the mouth or intravenously in 10 c.cm. doses. The ordinary horse serum which you obtain from manufacturing chemists is of value, and Dr. Gulland has found that the effect lasts about a month and has used with good result prophylactic doses given once every four weeks. You may speculate as to the danger of anaphylaxis, but in his experience the risk is slight, and can be obviated by a small preliminary injection when from the time interval you suspect this danger.

ARTHRITIS AND SCLERODERMIA.

There is a very unusual form of arthritis met with in children and young adolescents which is associated with sclerodermia and Raynaud phenomena. The appearances of these cases is remarkable, for their skin is like leather and cannot be picked up from the hardened and atrophied muscles below. The trunk and the extremities may be affected and the articulations are stiff from the induration of their ligaments; the hands and feet appear withered, and attacks of cyanosis may occur accompanied by acute pain. Over the elbows the skin becomes reddened and so thin that the bones seem ready to break through. To a lesser degree there is the same appearance over the knee-joints. In some instances the skin over the elbows shows a chronic dermatitis and, giving way, fissures form which are very slow in healing.

The usual history of these cases is that there have been attacks of arthritis—or as they are termed "rheumatism"—and that these have gradually increased in gravity and duration. I have never myself seen a case in which the joints have shown any effusion, but they have been invariably stiff and shrunken and the skin over them shiny and a dull-red colour. As you may imagine, the treatment is most discouraging. Some improvement has been obtained with iodolysin combined with local treatment by radiant heat and inunction of oil, and together with these are combined skilled massage and manipulation. I have also seen psoriasis associated with these cases which has interested me, because I have noticed that this skin disease in the

young not infrequently occurs in rheumatic cases that are subacute and liable to show unusual features.

Raynaud phenomena are not confined to these rare cases, but in adult life may be met with in rheumatoid arthritis, and in a paper on "spasmodic symptoms in rheumatism" I have described their occurrence in the acute rheumatism of childhood. In such cases there has been an obvious attack of acute rheumatism with arthritis and valvular disease, and then some months or even a year later the hands and forearms may show the characteristic sudden cyanosis accompanied by intense pain. In these cases the condition has yielded to electrical treatment and massage, together with precautions against undue exposure to cold.

MYSTERIOUS ARTHRITIS.

There remain some mysterious cases of arthritis which are to me most perplexing, and I have been glad to find that my colleague, Mr. H. A. T. Fairbank, in his wide experience, has met with the same difficulty. It is in connexion with the hip-joint that I have met with these particulars. This, for example, is an instance:—

A rapidly growing boy of 14 years fell in a football scrummage with his right leg strongly abducted. At the time he had pain, but this passed off and remained absent for the rest of the day and during the night. The next day he had to stand in the train for a long time, and when walking in the afternoon began to feel discomfort in the joint. That night he woke with severe pain and his temperature was 102° F. Next day there was fullness over the hip-joint and great pain on movement. In this case there was no evidence of acute rheumatism, and the immediate fear was an acute epiphysitis. The late Mr. T. H. Kellock saw him with me in consultation and advised the policy of rest with close supervision, and agreed that there was an acute arthritis. The symptoms subsided and the temperature dropped slowly to normal, and a perfect recovery resulted.

Mr. Kellock at the time told me that he had seen several similar cases in growing boys. Such a condition as this coming on when an interval of time has elapsed after the probable injury—an interval during which there has been no apparent evidence from pain or limping of a direct reaction to injury—is always disquieting, and particularly if with the onset of the pain the boy, as in this case, looks ill and has definite fever. The possibility of an acute osteo-myelitis of the head of the femur must be a cause of great anxiety. There are, however, other cases of mysterious arthritis of the hip-joint with no history of injury. These may occur even in infancy, and if one can judge from their course are apparently not tuberculous in nature. Even if their course is not always favourable but leads to a destruction of the cartilage and erosion of the bones, still it does not resemble that of tuberculosis, but more closely the condition which we associate in adults with acute osteo-arthritis.

TREATMENT.

The treatment of arthritis in childhood rarely presents any special features from the medical aspect. Rheumatic arthritis is frequent, but with rest the rapid subsidence is remarkable, and we all know the value of the salicylate co pounds for this symptom.

The problem in Still's disease is far different. Every sort of drug and treatment has been tried, but no one can claim any certain remedy. I think we should all agree that septic foci should receive treatment, but there has been no convincing evidence in my cases that as a result the disease has relented. On the other hand, I am certain that the milder forms with persistent treatment and careful nursing make very considerable improvement. At one time soured milk seemed to do good. Intestinal disinfectants, such as small doses of calomel or β-naphthol and such like, have never appeared to me to have any clearly defined success, and the same applies to renal disinfectants and vaccines. I have previously insisted on the importance of such an individual being rescued from damp and cold surroundings. How such surroundings alter the chemical processes of the human body I do not understand. But I believe that they so damage the connective tissue skeleton that an infection not necessarily massive or continuously supplied from a local focus and not necessarily of a peculiar virulence can produce profound disturbances which cannot be rectified because the power of resistance is deficient and the infection itself not destroyed. Of local remedies I have seen some benefit from the treatment by ultra-violet rays. There can, however, be little doubt, I think, that we are in the same difficulty with this disease as with the rheumatoid arthritis of adults.

A YEAR'S EXPERIENCE OF INSULIN.*

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THIS paper gives a brief report of the results obtained in the treatment of diabetes with insulin, in Dr. Cowan's wards, during the year March, 1923, to March, 1924. During this year 49 patients were admitted for treatment, and Table I. shows the age and sex incidence, and mortality among these cases:—

TABLE I.—*Incidence and Mortality.*

Age.	Male.	Deaths (to date).	Female.	Deaths.
1–9	2	—	—	—
10–19	5	1	2	1
20–29	3	—	5	—
30–39	6	—	4	2
40–49	6	—	3	—
50–59	2	—	4	—
60–69	2	—	3	—
70–79	1	—	1	—
Total ..	27	1	22	3

Forty-nine cases, of whom four were dead before March 1st, 1924.

All were suffering from glycosuria, but the significance of this symptom varied as shown in Table IA.

TABLE IA.—*Variation in Incidence of Glycosuria.*

—	Male.	Female.	Total.
"Renal" cases	—	2	2
"Lag" cases	2	—	2
Not diabetic	2	3	5
Diabetic, but not suffering from diabetes	2	5	7
Diabetic, and suffering from diabetes	21	12	33

Diagnosis.

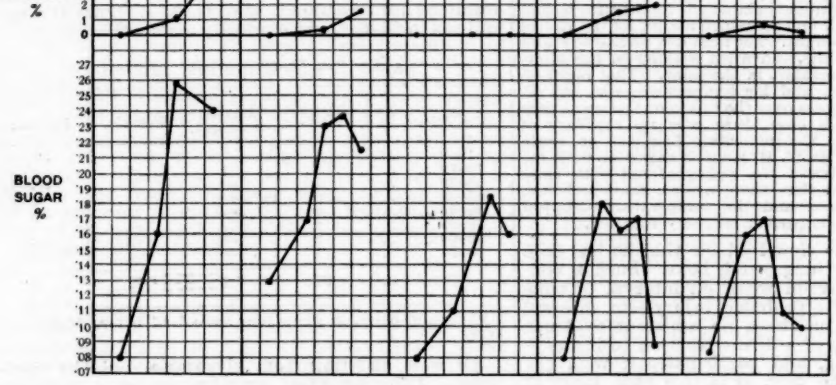
With regard to diagnosis, there is very general agreement that, particularly in the selection of cases for insulin, it is essential to discover whether or not one is dealing with a case of true diabetes. The method adopted to differentiate in doubtful cases was the "glucose test." Urinary analysis following the ingestion of glucose or other carbohydrate is not conclusive, though the presence of a trace of sugar in the urine after, say, 25 g. of glucose, unaltered in amount after 150 g. glucose, would certainly be very suggestive of a non-diabetic glycosuria; but by the glucose test only can a proper distinction be made with fair certainty. The two "renals" and two "lags" in this series were tested in this manner as were also the milder diabetics. In the more severe diabetics such a test was, of course, unnecessary. The results obtained from these and numerous other observations would seem to show that the information

* The expenses of this investigation were borne by the Medical Research Council and by a grant from a fund raised by Jas. Macfarlane, LL.D.

obtained from the glucose test is reliable in the great majority of cases, but the following cases are worthy of attention:—

CASE 1.—M. L., a well-nourished girl of 15, was admitted on Feb. 5th, 1924, complaining of thirst and polyuria, which had come on suddenly three weeks before. She had been employed for six months in a baker's shop, and had eaten sweetened cakes in large numbers during that time. The family history was negative. The urine contained 3 per cent. sugar. Glucose tests were performed, as shown in Chart 1. The first test was made after a brief period of starvation, but from that time onward the diet remained constant at C. 80, P. 60, F. 120. The first and second glucose tests gave typical diabetic curves with urinary sugar results to correspond. The fourth and last tests give curves which, with the urinary sugar observations, would suggest a renal glycosuria.

CHART 1.



All tests were made in the early morning before any food had been taken.

CASE 2.—J. D., a boy, aged 6, was admitted to the wards on Sept. 7th, 1922, complaining of headache, thirst, and frequency of micturition of some 2½ months' duration. While in hospital there was never more than a trace of sugar in the urine, and his blood-sugar, with one exception, never exceeded 0·15 per cent. Chart 2 shows the result of a glucose test at this time. The first curve might be called a "lag," though no sugar was detected in the urine. Certainly the return of the blood-sugar to normal in 1½ hours is satisfactory. Less than a year later he was readmitted to hospital, and now insulin was necessary to keep the urine sugar-free. Curves 2 and 3 show the results of glucose tests at this time, and are clearly diabetic. The boy had not been kept on strict diet during the intervening period.

It would thus seem clear that it is dangerous to rely entirely upon the result of a *single* glucose test. Two or three observations should be made at intervals of some weeks, particularly in doubtful cases.

Treatment.

In view of the possibility of error, as shown in the results given above, the "renal" and "lag" cases were advised to refrain from obvious sugar, but no other limitation was placed upon their diet. The "not diabetic" cases, five in number, were patients admitted for treatment of some quite different disability in whom a glycosuria was discovered on routine examination of the urine. Three were old arterio-sclerotics; one man suffered from locomotor ataxia; and one was a woman of 47 with bronchitis, and a coli infection of the urinary tract. In all five the morning blood-sugar reading was normal. In these cases the glycosuria was transient, and disappeared quickly on a slightly modified carbohydrate diet with no severe restrictions. All these cases were instructed to return for observation, and many have been re-examined at an interval of three or four months to confirm the correctness of the diagnosis. The seven diabetics who showed no symptoms of diabetes save glycosuria were treated on the usual Allen lines, and all left hospital sugar-free on an adequate diet. It might be mentioned with regard to the "Allen" diets employed, that protein and fat were never so restricted as recommended in the earlier "Allen" treatment, the object being to render the patient's stay in hospital as brief as possible. Later, following the work of Newburgh and Marsh, most diet schemes have been modified in a similar manner—with perhaps a rather lower protein content—thus confirming the wisdom of the practice which we had adopted from a practical standpoint.

Of the patients who were suffering from diabetes two males and one female did not require insulin. Thirty of the 33 patients suffering from diabetes required treatment with insulin. Of these, 11 were given insulin at once on admission to hospital. These cases fall into two categories: (1) acid cases; (2) cases showing much emaciation, frequently with signs of cardiac failure.

(1) Eight cases showed severe acidosis. The first essential in these cases is to eliminate the acidosis, and to this end insulin was given in large amount together with a diet containing a considerable amount of carbohydrate. The largest dosage of insulin required in these cases was 70 units in the 24 hours, but in most cases 10–30 units in the 24 hours was sufficient. (Chart 3.) Various diets were experimented with, but an oatmeal diet with insulin appeared undoubtedly to be the most efficacious in rapidly clearing up the acidosis. The "oatmeal diet" employed was similar to that of Van Noorden save that eggs and butter were omitted; 300 g. of oatmeal were soaked in 3000 c.cm. of water, strained, then boiled for ten minutes, and 300 c.cm. of the resulting gruel were given two-hourly. The value of this diet was approximately C. 60, P. 12, F. 12. Opinion is divided as regards the advisability of giving sugar in these cases, and, as MacLean has pointed out, the blood-sugar is invariably so high that further carbohydrate seems contra-indicated. Despite this fact we have always given a certain amount of carbohydrate in all such cases, with, of course, a minimum of fat.

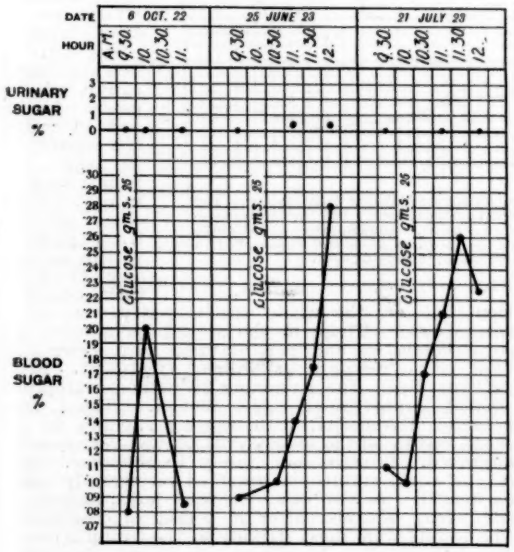
(2) Three cases were so emaciated as to make immediate feeding necessary. In these cases the patient was placed at once upon a calculated adequate diet with insulin cautiously added until the urine became sugar-free. When necessary cardiac stimulants, digitalis, caffeine, &c., were employed. (Chart 4.) The remaining diabetics (22 in number) all commenced treatment on the usual dietetic lines, and every

endeavour was made to treat without insulin. The necessity for such a procedure is obvious in hospital cases, and particularly in the earlier days when insulin was expensive and no provision had been made for obtaining it outside. In three patients only were we successful, but it must be remembered in this connexion that the majority of the cases were severe, and many were cases in which we had had little success on previous admissions. In the others the optimum diet was found, and this proving insufficient for the patients' needs, gradual advances were made with the careful administration of insulin. The first method adopted to gauge the dose of insulin was to give a small dose of insulin followed by a "fixed meal," the food value of which was C. 20, P. 18, F. 25. Blood-sugar estimations were made before the meal and at hourly intervals thereafter for four hours, while the urine was obtained two hours and four hours p.c. By this means we hoped to avoid a hypoglycæmic reaction, and also to correlate the blood and urinary sugar findings with a view to dispensing with the blood-sugar analysis. As expected, we found that while sugar remained in the urine blood-sugar estimations could be omitted, but when the urine became sugar-free they were essential.

The "fixed meal" was incorporated in the diet of the patient once or more often in the day as might be necessary. With further experience the "fixed meal" was dropped, and meals of any type containing the bulk of the day's carbohydrate ration were substituted.

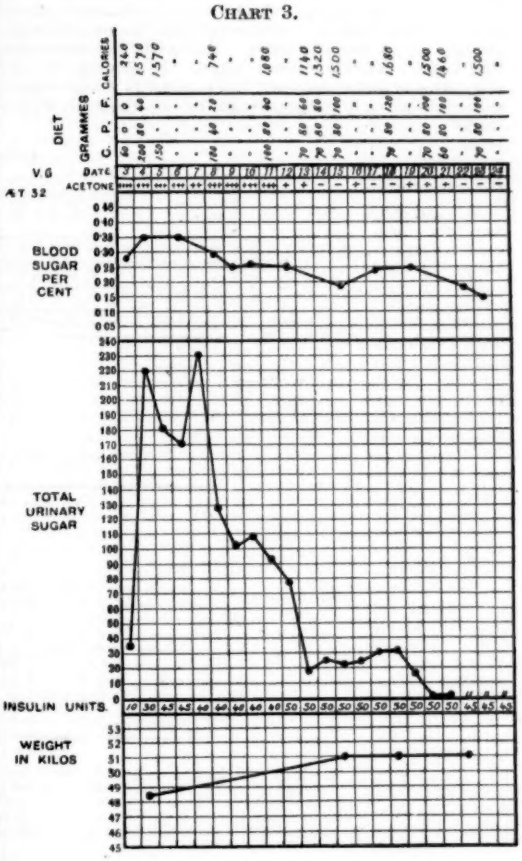
In the earlier cases blood-sugar estimations were made very frequently as explained above. Gradually the number of estimations was reduced until observations were made only in the morning and four hours after each dose of insulin, a method which we still adopt in the earlier stages of all cases while the dosage is being regulated. Later on in treatment a blood-sugar estimation was done in the morning twice a week, and the urine was tested about noon and in the late evening for sugar. In all cases the 24-hour urine was carefully collected and its sugar content measured. Any discrepancy between this result and the noon and evening results was noted, and the necessary adjustments—e.g., increase in the size or number of doses of insulin, or transference of carbohydrate from one meal to another—were made accordingly.

CHART 2.



Speaking generally, treatment followed two lines. The first was that advocated especially by Graham in which the blood-sugar was kept within normal limits with a minimum of insulin and of carbohydrate. Particular attention was paid to a normal pre-breakfast blood-sugar. Undoubtedly this was a most satisfactory method of treatment, and an endeavour was made to treat the early cases, and the young, on these lines. As the blood and urinary sugars are more readily controlled in such cases the majority could be so treated. This method, however, demanded a rather long residence in hospital, while the diets on dismissal were generally inadequate for the more or less heavy work which these patients had to perform. Thus, in the majority of cases the régime was soon broken.

CHART 3.



To illustrate the treatment of an "acid" case with insulin. Carbohydrate is given in amount with a minimum of fat, accompanied by large doses of insulin. With the disappearance of acetone from the urine the carbohydrate is cut down, the fat is increased, and insulin dosage is maintained until the urine becomes sugar-free. Subsequently the dose of insulin is gradually reduced.

The second method was to select a calculated adequate diet for the patient, commence with this as soon as it was decided that insulin was necessary, and, by gradually increasing doses of insulin, bring the urine sugar-free with, if possible, a blood-sugar constantly within normal limits. For the old-standing case and for the elderly this was the method of choice; and for the average hospital case, whose carbohydrate tolerance was found to be low and diet inadequate, we considered it to be the more satisfactory.

Insulin was usefully employed to expedite treatment in certain cases. A stout young woman of 22 was admitted with much sugar and acetone in the urine. She would probably have done quite well on diet alone, but as it was difficult to bring the urine sugar-free by starvation, and as time was a consideration, small doses of insulin were administered and continued for a week. Sugar and acetone quickly disappeared, and the subsequent treatment proceeded on the usual dietetic lines. Recently this procedure has been employed more often. It should be used only where, as in hospital, the patient is under careful observation and progress can be checked by blood-sugar estimations.

Hypoglycæmia.

We did not, as has been advocated, cause in each patient a slight hypoglycæmic reaction. In only two cases did such a condition arise. Both patients wakened up in the middle of the night restless and perspiring freely. A cup of hot tea with about 15 g. of bread was sufficient in both cases to clear up the condition in a few minutes. Where it seemed possible that trouble might arise in the night after an evening injection, the patient has been advised to keep a small portion of his carbohydrate ration and to eat it just before going to bed. This has proved very satisfactory, and would appear to be a perfectly sound and safe procedure.

Deaths.

Four cases died during the year, one male and three female.

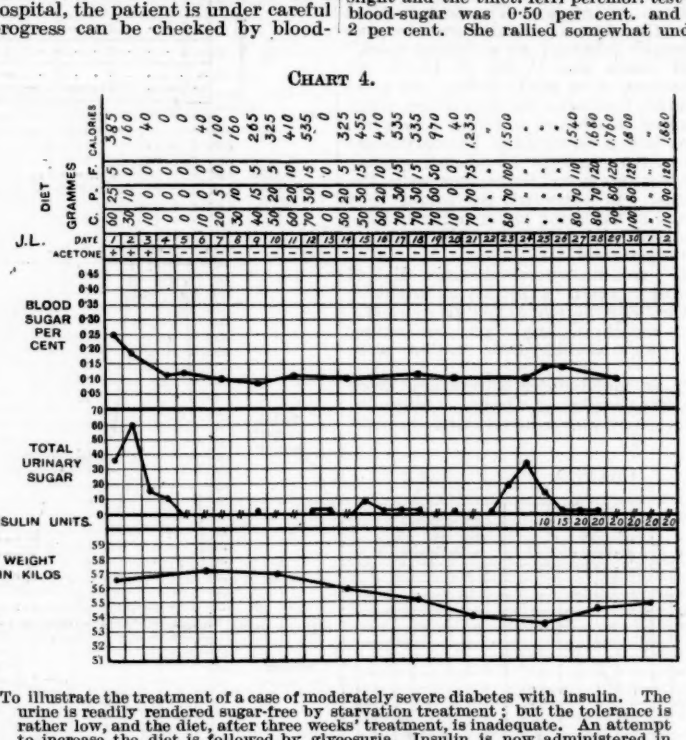
The man was known to have had diabetes for two years, and on a previous occasion coma had seemed imminent but had been averted. He had been in bed for two weeks before admission, and had become very ill the previous day. On admission he was collapsed and cold. The pulse was rapid and poor in quality. The respirations were frequent and sighing in character. The breath smelt strongly of acetone, and he was very drowsy. The blood-sugar was 0·265 per cent.; the urine contained 5 per cent. sugar, acetone +++, and a heavy cloud of albumin. There was a marked lipæmia. Under stimulation and with insulin, 45 units, the pulse improved, he became more intelligent, and the drowsiness practically disappeared; but the pulse gradually failed, and he died 12 hours after admission from cardiac failure.

One woman, who had previously been treated in hospital and who was carrying on with insulin outside, was admitted with broncho-pneumonia. The urine contained 2·7 per cent. sugar, and acetone +++. The blood-sugar was 0·40 per cent. There was no suggestion of drowsiness, and the respirations were rapid and shallow. Under insulin, 90 units, the acetonuria practically disappeared in 48 hours, but she died of cardiac failure, mentally clear to the end.

The second female was a girl who suffered from diabetes of a moderately severe type, together with an extensive tuberculous lesion of the right lung. Treatment of the diabetes with insulin was very satisfactory, but she had several severe attacks of hæmoptysis while in hospital. On dismissal she was transferred to a sanatorium, where she died shortly afterwards.

The third case was somewhat similar to the first. She was a woman of 33 years, admitted unconscious, cold, collapsed, and pulseless. She had a broncho-pneumonia. The breath smelt slightly of acetone, but acetonuria was slight and the tinct. ferri perchlor. test was negative. The blood-sugar was 0·50 per cent. and the urinary sugar 2 per cent. She rallied somewhat under stimulation, but she never became conscious. 60 units of insulin in all were administered, but death occurred within 24 hours.

CHART 4.



To illustrate the treatment of a case of moderately severe diabetes with insulin. The urine is readily rendered sugar-free by starvation treatment; but the tolerance is rather low, and the diet, after three weeks' treatment, is inadequate. An attempt to increase the diet is followed by glycosuria. Insulin is now administered in small doses when the urine is kept sugar-free on an increasing diet.

Review of Results.

When we review the results obtained in these cases it is convenient to consider them under two groupings: (1) Those admitted for the first time during the year, and (2) those who had previously been under treatment. The first group consists of 21 cases, 7 female and 14 male; the second of 12 cases, 5 female and 7 male. The cases in the first group varied in the severity of their condition, but on the whole the majority were of a severe type. Those in the second group were all severe diabetics and patients who had shown but little or no response to "Allen" treatment. Four patients died. The remaining 29 without exception showed improvement under insulin. Thirst and polyuria disappeared with varying rapidity in all cases, and in all the mental outlook was very greatly improved. Pruritus was rarely troublesome. One case of toxic amblyopia benefited very greatly while on insulin. In two cases the knee-jerks, absent on admission, returned after a period of treatment. The results were most striking in the Group 2 cases. All of these cases, 12 in number, showed glycosuria when readmitted to hospital, and several were very acid. All had suffered more or less severe relapses, and seven had been in hospital on one or two occasions on account of these before being readmitted for insulin treatment. Regular work of the type which they could perform was impossible to them. With insulin relapses have been infrequent and slight in degree, and hospital treatment has not again been necessary in any one of them. The appearance of general well-being in patients who had so long borne the dejected air of the chronic and hopeless invalid was very remarkable. The factors which contributed to this will be considered in greater detail.

Weight.

The weights in both groups varied as follows:—

	Gain.	Loss.	Unchanged.
Male	6	7	8
Female	2	4	6

From these figures it is clear that in the majority of cases the weight either remained unchanged or fell *while under treatment in hospital*. The significance of this point is recognised when it is remembered that the great majority commenced treatment on starvation diets. The greatest loss of weight was 4 kilos, and the average loss 1·9 kilos. The greatest gain was 10 kilos occurring in an emaciated patient admitted with a carbuncle on the shoulder. The average gain was 3·9 kilos. A gain in weight was more frequent among the younger patients. In six patients below the age of 20 a gain in weight was recorded in five. The sixth suffered from pulmonary tuberculosis.

Of the 12 patients who had been under treatment once or more often in hospital a gain in weight occurred in six: four remained unchanged and two showed a slight loss amounting in each case to about one kilo. A "follow up" of these cases, however, has revealed a much more satisfactory result. In all who have carried out treatment conscientiously a gain in weight has been invariable. Two women, one a clerkess, the other a mill-worker, have gained 5·5 kilos and 8 kilos respectively in the three months following dismissal. A boy, who gained 5 kilos while in hospital, has gained an additional 9 kilos in six months. Inevitably the less intelligent manual workers have fared most badly.

Carbohydrate Tolerance.

	Gain.	Loss.	Unchanged.
Male	5	1	1
Female	5	—	—

The gain in carbohydrate tolerance among the second group of patients was very constant. One case gained 105 g.; the average gain was 42 g. The "unchanged" case was one complicated by a carbuncle. The "loss" case showed a decrease of 20 g. in tolerance with reasonable dosage of insulin. He was a ploughman who had paid no attention to diet following his previous admission, and who had considerably deteriorated in consequence. Only very occasionally has an attempt been made to increase the carbohydrate tolerance after dismissal. Where improvement has occurred the insulin has been reduced either in amount or in the number of doses required, almost every patient regarding this as the greater boon.

In July, 1923, I reported a case in which under insulin the carbohydrate tolerance was considerably increased, and where subsequently the insulin was gradually cut out, the patient remaining free from glycosuria on the increased carbohydrate. This case was readmitted four months later with a carbuncle, the urine loaded with sugar, and acetonuria ++++. On this occasion he left hospital with the carbohydrate value unchanged from the previous dismissal, but he now required 35 units of insulin per day to keep the urine sugar-free.

In another case, a man aged 34, treated by diet alone, the carbohydrate tolerance reached 90 g. per day, at which level it ran for eight months. The urine was sugar-free during all this time, and the weight remained stationary. In March, 1924, he contracted influenza, and was ill for about three weeks. Sugar returned in amount, and now he requires 16 units of insulin per day to keep the urine sugar-free on 70 g. carbohydrate.

In none of this series in the brief period under review have we succeeded in raising the carbohydrate tolerance to a level which could be maintained without insulin, even among the early or younger patients.

Acidosis.

This has given rise to little or no trouble. In hospital the urine became acetone-free very readily. In one case acetonuria presisted for 18 days, but this was quite exceptional. Occasionally patients returning to report showed considerable acidosis, but errors in insulin dosage or in diet were always found to account for this condition.

Dosage.

The dose of insulin varied very greatly. Apart from those cases who died, the highest dosage given in any case was 70 units in the 24 hours. The average maximum dose was 30 units. The average dismissal dose was 22 units, the amounts varying from 50 units in one case to 5 units. In all cases where insulin was required on dimissal, diet was so arranged as to allow of at most a morning and evening injection. The objections to a midday dose in the case of working men are obvious. We have even found it more expedient to allow a slight glycosuria rather than to insist upon a more frequent dosage. Hospital patients tend to lose heart and to abandon treatment in despair when too many injections are demanded of them.

Sepsis.

Three patients were admitted suffering from septic infections—one from an otorrhœa, one from a large carbuncle on the shoulder, and a third from numerous carbuncles and abscesses on the back.

In the first case the otorrhœa, which had been troublesome for some time and had suddenly flared up, rapidly cleared up and hearing was much improved. This patient had previously left hospital on 100 g. carbohydrate with 30 units of insulin. While discharge persisted from the ears the carbohydrate tolerance was lowered to 80 g. with the same dose of insulin, but later it returned to its former level. In striking contrast to this result was the experience of the same patient before treatment with insulin was available. He was admitted in November, 1922, with a severe sepsis of the left hand, the result of striking his thumb with a hammer while at work. With difficulty the hand was saved, and two months later healing was not complete. During this time the glycosuria could not be controlled by diet, and his general condition greatly deteriorated.

The second case was very ill on admission and very acid. The carbuncle had been opened just before he came under observation. With insulin the acidosis disappeared, the slough rapidly separated, and healing proceeded comparatively quickly. The effect on carbohydate tolerance and weight in this case has been referred to above.

The third case was that of a very stout man—he weighed 102 kilos—admitted with a large carbuncle on the neck and two others on the back, together with numerous small boils. He was very ill. The urine contained acetone +++ and sugar 5 per cent. Upon a low diet (C. 80, P. 60, F. 20) and with a maximum insulin dosage of 50 units the acidosis and glycosuria gradually disappeared. He passed successfully through three operations under insulin, and healing, though slow, was satisfactory.

Capacity for Work.

Most patients have been able to return to their old employment. One man continues to work as a bricklayer and loses no more time than his fellows. Another works all night in a printing office. Two carry on successfully as commercial travellers. One is at work as a tramway conductor. Two boys attend school regularly. The majority of the women are at home, and these are quite fit for their housework. Two find no difficulty in accomplishing their work as clerkesses; one is a mill-girl, two are in domestic service, and two are nursing, both in rather strenuous employment. Nevertheless, it is difficult to assess the capacity for work in all at the present time. Some who are fitted for light work only are compelled to do labouring or some equally unsuitable work. In time they are forced to give up and remain idle.

ROYAL WEST SUSSEX HOSPITAL.—The ninety-eighth annual report of this institution for the year which ended on Dec. 31st, 1924, shows that the total number of in-patients treated during the year was 1041, while 2423 out-patients made 6715 attendances. Besides these there were 1024 attendances in the X ray department and 1920 patients were treated with electrical massage. Unfortunately, the expenditure exceeded the income by £1624, but there was a gratifying increase in patients' donations—namely, £1649 as against £1415 in 1923.

THE OPERATIVE TREATMENT OF CLEFT-PALATE.*

A RECORD OF RESULTS IN 125 CONSECUTIVE CASES.

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THE operation for the closure of a cleft-palate is on a plane very different from that occupied by most of the commonly performed surgical operations in that the results, immediate and remote, are uncertain and sometimes very disappointing. It seems desirable, then, that surgeons who have had the opportunity to perform this operation in a comparatively large number of cases should follow up their results, assess these as accurately as they can, and publish them. If we are to make an advance in cleft-palate surgery towards a higher standard of efficiency we can only do so by a study of our present results in relation to surgical technique, type of cleft, and other factors.

After-Results.

The 125 patients in this series have been operated upon by me since June, 1911, and the immediate result—the result at time of discharge from hospital or nursing home—recorded in each case on the list which I kept, so uncertainty from ambiguous statements, or from lack of any statement at all (as is encountered not infrequently when one searches hospital notes), has been avoided.

In regard to the more important matter of the late or functional result an attempt has been made to trace and examine every case in which an immediate or anatomical success was secured; I excluded from these the very young patients (10) on whom the operation has been performed within the last two years on the ground that sufficient time had not elapsed to permit of a proper examination of their speech. Eighty-four patients have been written to, and of these 58 have been traced; 49 of these 58 have been personally examined by me, while in 8 cases I have had to rely on information obtained from the parents or school teacher. One child died two years after a successful closure. It is disappointing that so many (26) have not been traced, but it is not surprising, for many of the operations were done 10 to 13 years ago.

The patients (23) in whom partial union only was secured have not been systematically followed out; most of these present defects of various sizes in the hard palate with an intact soft palate; it is known that some of the older ones have had their speech materially improved by the fitting of an obturator to the hard palate defect. A minority present an intact hard palate with a cleft, complete or partial, of the soft palate; probably many of these could be benefited by further operative measures.

The patients (7) in whom the operation was a total failure must be regarded not merely as failures, but as being in a worse plight than the patient whose cleft has never been operated upon. The same view, it should be added, must be taken of two of the partial union cases in whom the resulting defect was a very wide one.

Type of Operation and Age of Patient.

The Langenbeck operation has been employed throughout, and in this the technique and modifications introduced and described by J. Berry [1] have been followed fairly closely. The operation has not been done in children under 2 years of age, except in the case of unusually well-developed children and those whose cleft involved only the soft palate.

During the past 20 years much attention has been focused on the question of the best age for the operation, particularly so since the introduction of Lane's operation. Probably nearly all surgeons now agree that the whole aim of the operation is to restore the palate as an organ of speech whilst interfering as little as possible with the conformation of the upper jaw and teeth; and that the technique of the operation and the determination of the most suitable age for it must be based on this object and not on the mere cobbling up of a structural defect. Berry and R. W. Murray [2] made this point so clear at the time of the cleft-palate controversy in 1911 that it may seem platitudinous to repeat it now, but one still not uncommonly encounters a feeling in the profession that the operation should be done "early" for the sake of the child's nutrition. As a matter of fact, it is remarkable that so very few infants with complete cleft-palate perish between the performance of the hare-lip operation at 3 months of age, and the time for the palate operation at, say, 2 or 3 years of age. It is often said that the best time for the Langenbeck operation is before "faulty habits of articulation have been acquired," but against this apparently sound advice it must be stated that very good speech results may be obtained by performing the operation long after the acquisition of faulty habits of speech by the child, and also that faulty habits will follow inevitably on a defective operation performed before the child begins to speak at all. The most suitable age, I believe, for the operation is that between 2 and 4 years. The exact age must be decided in each case according to the type of cleft and the condition of the child.

One step in the performance of the operation is worth dwelling on, because I believe it has a most important influence on the quality of the functional result, and that is the stage at which the operator has freed the nasal surface of the soft palate from the posterior edge of the hard palate; at this point he draws down the palatal flap towards himself in order to gauge its mobility, and in doing so he obtains (with good illumination) a clear view of one or two folds of mucous membrane running from the nasal surface of the soft palate upwards along the lateral wall of the naso-pharynx; division of these folds—which contain a considerable proportion of the elevator muscles of the soft palate—will much improve the mobilisation of the palatal flap and therefore render median suture very easy, but such a step should not be carried out except in those cases where the cleft is unusually wide, and then the division should be made sparingly and at one point only. I believe that the poor speech met with in some of my cases has been caused by free division of these folds; such cases when seen a few years after operation may present a palate of very good appearance but with poor mobility.

Causes of Failure to Secure Complete Union.

The causes of failure to secure complete union in this series may be classified as follows:—

1. Performance of the operation in unsuitable subjects—i.e., children of poor physique, anæmic children, and children showing a fairly severe grade of catarrh of the naso-pharynx with muco-purulent secretion.

(2) Infection from pre-existing infection of naso-pharynx, as in No. 1. Latent infection—scarlet fever and measles—at time of operation. A severe infection is likely to cause a breakdown of the entire suture line.

(3) Ischæmia of the edges of the cleft, from too extensive lateral incisions or from the tying of sutures too tightly, is often responsible for a hole at the back of the hard palate. Such a hole, even if fairly large, may close spontaneously in the course of months, but the resulting palate is shortened from dragging forwards of the soft palate by cicatrisation.

(4) Inversion of epithelial edges is another cause of holes, particularly in the hard palate.

(5) Tension. This is usually regarded as the source of all evil, but I have not found it by itself to be a

* A paper recently read before the Manchester Surgical Society.

[1] Berry, J., and Legg, T. P.: Hare-Lip and Cleft-Palate. London: J. and A. Churchill. 1912.

[2] THE LANCET, 1911, ii., 1466.

common cause of failure. In many cases there is little or no tension on the flaps at the conclusion of the operation. Tension begins to exert an influence a few days after operation as the lateral incisions begin to contract, and may then produce a gap in the suture line, particularly at the front part of the soft palate, unless the edges of the cleft have been accurately sutured with a durable material (silkworm gut).

Analysis of Results.

The results obtained in this series are set out in two groups. The first group represents the immediate anatomical results, and the second group the late results as judged by the quality of the speech. It is noteworthy that the series is made up of consecutive cases, and presents an unusually large proportion of complete clefts.

Number of patients operated upon, 125. Mortality=1, or 0·7 per cent. (death due to reactionary hæmorrhage 24 hours after operation).

A.—*Immediate Results.*

1. Complete clefts, 67. Complete union, 42 (62 per cent.) (three of these after two operations); partial union, 21 (31 per cent.); total failure, 4 (7 per cent.).

2. Incomplete clefts, 57. Complete union, 52 (91 per cent.); partial union, 2 (3 per cent.); total failure, 3 (6 per cent.).

3. Summary of all clefts, 124. Complete union, 94 (76 per cent.); partial union, 23 (18 per cent.); total failure, 7 (5 per cent.).

B.—*Speech Results.*

In regard to the classification adopted in the following tables children classed as "good" have been able to speak clearly in conversation or in dictation, without gross defect, so as to be readily understood by a stranger. Many of them could be fairly described as having normal speech. In the "moderate" class the children have been able to sound the explosive consonants, and "Z" and "sh" when tested by simple words, but their ordinary conversational speech has been definitely defective. In the "poor" class the speech has retained the cleft-palate characteristics, though the child has been able to pronounce some of the explosives with effort; most of these children speak better than the average child with an unclosed cleft. Very few of these children have had skilled training in speech after the operation; probably several in the moderate and poor classes could be materially improved by such means. The numeral before the patient's initials indicates the age in years of the patient at operation, and that after the initials the number of years intervening between operation and examination of speech.

Complete Clefts, 30.

Speech good, 15.				Speech moderate, 9.		Speech poor, 6.	
2. W. B.	13	6. T. L.	5	4. J. P.	12B	2. E. B.	9B
3. J. S.	13	2. J. Mc.	4	2. A. F.	9	2. W. K.	5
3. H. O.	13	2. F. C.	4	2. E. B.	7B	2. E. B.	4
7. D. R.	13	3. R. H.	4	4. M. V.	7	9. J.H.R.	3
3. E. S.	12	2. I. F.	4	2. R. H.	6	4. R. H.	3
2. S. T.	10B	2. E. B.	3	11. R. H.	4	2. W. S.	3
7. C. H.	9	3. L. S.	3	2. G. M.	4		
2. W. S.	5			5. F. A.	4		
				2. H. R.	3		

B = bilateral cleft palate.

Incomplete Clefts Involving Hard and Soft Palate, 17.

Speech good, 7 (3 normal).				Speech moderate, 6.		Speech poor, 4.	
3. A. H.	12	4. K. J.	3	5. A. H.	9	3. J. L.	6
7. C. P.	10	2. M. C.	4	2. L. D.	6	12. M. B.	5
4. J. S.	10	2. F. W.	3	4. A. S.	5	2. T. R.	4
6. C. G.	8			2. V. C.	4	2. S. L.	4*
				7. W. W.	4		
				2. D. R.	3		

* Feeble-minded.

Soft Palate Only, 10.

Speech good, 9 (5 normal).				Speech moderate.		Speech poor, 0.
4. M. T.	12	4. D. J.	4	9. M. Mc.	2	
5. G. C.	10	4. J. C.	4			
1. A. E.	7	2. J. B.	4			
7. B. O.	6	5. J. H.				
1. T. G.	5					

Summary of speech results in 57 cases: Speech good, 31 (55 per cent.); speech moderate, 16 (28 per cent.); speech poor, 10 (17 per cent.).

Causal Factors of Bad Speech After Closure.

Examination of these children has shown very clearly that a child who speaks badly a few years after the closure of a cleft palate will be found to have a palate shortened in length from front to back or a soft palate that is not elevated during phonation. A well-formed alveolar arch is also an important factor in the determination of really normal speech as distinct from good speech, and hence a larger proportion of normal speakers will be found amongst the children whose clefts have been incomplete—in these the intact alveolar arch has prevented approximation of the maxillæ.

It has recently been urged by Gillies,[3] Kelsey Fry,[4] and others that closure of a complete cleft in young children (less than 6 years of age) will lead to narrowing of the alveolar arch and also to shortening of the palate, and that our methods of treatment should be radically altered to overcome these defects. This contention has some force and undoubtedly requires careful consideration, but it must be pointed out that marked contraction of the alveolar arch may be seen not uncommonly in cases of complete cleft-palate that have never been operated upon. This is especially the case in children who have had a wide alveolar gap under the hare-lip.

Narrowing of the alveolar arch met with after operative closure of a complete cleft-palate should not, therefore, be ascribed entirely to the operation; operation undoubtedly plays a part important or otherwise according to the age of the child at the time of the operation. Children whose hard palates have been closed during the first or second years of life will show contraction of the dental arch as the result of the operation; but if the operation is performed during the third or fourth years very little narrowing of the arch will result from it.

In regard to the shortening of the palate (a most important factor as a cause of bad speech after closure) I have noted repeatedly in the children in this series that many of the palates were abnormally short before operation, particularly in the case of the incomplete variety of cleft which reaches into the fore-part of the hard palate and attains its greatest width anteriorly; in such a type operation will by reason of the width of the cleft shorten the palate still more. Latterly I have been so impressed with the developmental shortening when met with in this type of cleft that I have advised against operation. It is said that median suture of the cleft must, by producing traction from side to side, inevitably lead to shortening in the opposite (antero-posterior) direction. This statement takes no account of the displacement inwards of the palatal flaps after proper mobilisation, nor of the real and immediate increase in length of the palate which the operation produces; this lengthening is due to the reduction of the antero-posterior arch of the palate—often abnormally high in these cases—which follows the falling downwards of the palate as a whole after free detachment of the muco-periosteal flaps and soft palate from the bony palate. Shortening of the palate caused by operation is usually due to the occurrence of a hole at the back of the hard palate; such a hole heals by the gradual pulling in of its edges, and so the soft palate is drawn forwards.

Conclusions.

In conclusion, the proportion of good results outlined in this paper cannot be regarded as satisfactory, yet it is large enough to lead one to believe that a much greater measure of success might be secured by closer attention to the various factors that influence the issue of the operation. The operation is not one to be undertaken by a surgeon whose sphere of practice does not afford frequent opportunities for experience in this field, nor by one whose interest does not extend beyond the immediate result; but undertaken with a proper appreciation of its purpose, technique, and limitations, the operation, I believe, will hold a high position amongst the operations of surgery.

[3] Brit. Med. Jour., 1921, i., 335.
[4] Proc. Roy. Soc. Med., Section of Odontology, 1921.

CLEFT-PALATE:

SOME PITFALLS IN OPERATION.

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ALTHOUGH individual surgeons of large experience obtain wonderful results by widely different types of operation for cleft-palate, yet it is common knowledge that the path of the average surgeon is strewn with gaping failures. These failures are in the main due to tension and sepsis.

Median Suture and Flap Operations.

The types of operation in most general use are the median suture (Langenbeck) and the flap operation (Lane). Of these the Langenbeck is undoubtedly the more popular and generally satisfactory from all points of view. Median suture ensures complete closure of the cleft more certainly than does the flap operation; it gives a movable soft palate of better length, and exercises a less harmful effect on the eruption of the teeth and the width of the alveolar arch.

There are few, if any, clefts undamaged by previous operations which cannot be successfully closed by median suture. Moreover, the mortality is negligible, which is far from being the case with the flap method. Its main drawback is that it cannot be used in early infancy, the most suitable age being from 1 to 3 years.

One of the consequences of operation by either method is the dragging forward of the soft palate to a greater or less degree. Recently Mr. Gillies has introduced a method to overcome this. He separates the soft palate from the hard and closes the cleft in the soft palate only, using an obturator to occlude the T-shaped aperture which remains. This no doubt makes for a better closing off of the naso-pharynx and so for better speech. The sufferer from cleft-palate, however, very seldom learns to speak normally, whatever operation has been performed; perfect speech in these cases is almost a curiosity.

A soft palate which is freely movable, and long enough completely to shut off the naso-pharynx, is doubtless an important factor in securing good speech after operation, but by far the most important one is prolonged and careful training in articulation, a desideratum quite unobtainable by the majority of patients. Probably most patients, if given the choice, would prefer an operation which made them independent of an obturator.

In the operation of median suture there are two things which must be avoided at all costs. They are both well recognised, and both are always mentioned in every text-book, article, and lecture on the subject, and both are consistently disregarded by the majority of surgeons when operating. These two things are tension and sepsis. Tension promises failure; tension plus sepsis guarantees it. Over tension we should have complete control, over sepsis control is necessarily less perfect.

Tension.

The relief of tension is usually attempted by means of inadequate lateral incisions. A further handicap to the success of the operation is the customary use of some form of tension suture. The use of tension sutures, to my mind, is a mistake for the following reasons: Ordinary tension sutures will relieve tension for the first three or four days, but at the end of that time, when the main suture-line is at its weakest, they will have so far cut into the palate as to be of little value as supports, while they will form additional foci of infection. The use of lead or other plates no doubt helps to relieve tension, but is apt to cause necrosis, and at best encourages sepsis by the presence of large foreign bodies. It is difficult to imagine a culture-bed of a more encouraging kind for organisms than a tape tied round the hard palate through the lateral incisions as advocated by some American surgeons.

Tension can best be prevented by making long lateral incisions. These should commence on the lower jaw on either side and be carried up the ascending ramus on to the upper jaw to the posterior border of the last tooth. Here the incisions turn inwards, and keeping immediately against the teeth are continued as far forwards as may be necessary, even to the canine tooth. These incisions, if properly placed, are well outside the tensor and levator palati muscles, and they therefore do not interfere with the mobility of the soft palate.

Sepsis.

Many children with cleft-palates are very badly nourished, and malnutrition greatly lowers resistance to infection, so that it may be necessary for the patient to be specially fed and nursed into good condition for some weeks before operation. A very great deal more care than is usual should be taken over the preliminary cleansing of the mouth; any mouth is of unknown potentiality as regards its infectivity, and no imaginable precaution should be neglected. Misplaced and carious teeth should be removed, and the gums, if unhealthy, swollen, or spongy, must be made clean and firm. This may be best achieved by wiping the gums two or three times a day with gauze swabs and a weak solution of citric acid. Above all, in every case the tonsils, whether visibly affected or not, must be enucleated, and the adenoids, if present, removed. An exception may occasionally be made in a case of a lesser degree of cleft in a small baby.

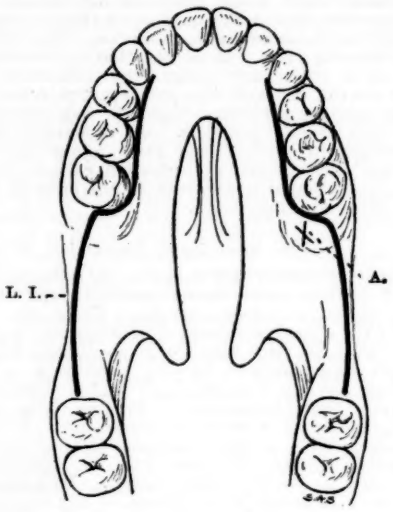
I regard the removal of tonsils and adenoids as the most important of all the preliminaries to operation. In the majority of cleft-palate patients, in addition to a large pad of unhealthy-looking adenoids, there are large dirty tonsils with their crypts blocked by collections of cheesy débris. The potentiality of such reservoirs of sepsis for causing an acute flare-up after an operation on the palate needs no emphasis. If the enucleation is skilfully done there is no fear that contraction of the soft palate will take place and make the subsequent closure of the cleft more difficult. The enucleation should be done not less than four weeks before the palate operation. The best age for operation is from 1 to 3 years, according to type of cleft.

Operation.

The child is arranged with a sand-bag under the shoulders, throwing the head well back. The surgeon sits at the head of the table, with his assistant on the child's right and the anæsthetist on the left. As the working space is confined, the simplest *efficient* gag is the best, and this, I think, is Mr. Waugh's small-toothed one. The tongue is held forward by a stitch or small-toothed forceps. Sponging is best done by the surgeon only, the assistant confining his attention to keeping the chin up and the tongue forward with his right hand, while with his left he steadies the patient's head. For the sewing up a good light is absolutely essential, and failing a powerful overhead lamp the best illumination is obtained from a head-lamp worn by the assistant, a much more convenient arrangement than for the surgeon to wear it himself. The mouth being well opened, the operation is begun by making the lateral incision on the side away from the gag.

The incision begins on the lower jaw and is carried up the ascending ramus on to the upper jaw behind the last tooth, then turning inwards it is continued immediately internal to the teeth as far forwards as may be necessary. An elevator is then worked into the incision a little in front of the last premolar, and the muco-periosteum is raised towards the middle line until finally the elevator appears in the cleft. The muco-periosteal flap is then separated from the bone as far back as the junction of the hard and soft palates, and also forward well beyond the end of the cleft, if that is incomplete, and nearly as far as the alveolar border in the case of the complete cleft. During this part of the operation there is free

bleeding, which can be controlled by gauze packing. The posterior part of the incision is then dealt with, an elevator being used to widen it and push the whole soft palate and fauces towards the middle line. Special attention is given to freeing the tissues at the posterior end of the alveolar border (see A in diagram). The incision is now plugged with gauze



L. I., lateral incision. A., alveolar border.

soaked in adrenalin, and after moving the gag across the procedure is repeated on the other side.

The next step is the separation of the soft from the back of the hard palate. This is best done with a small pair of sharply curved scissors working from the cleft outwards. It is never an easy part of the operation, and in a small baby with a cleft of the soft palate only may be extremely difficult. Nevertheless it must be thoroughly done and the separation carried out as far as the hamular process. It is convenient to work on the side opposite the gag. The two halves of the palate should now be absolutely flaccid, and meet without tension from end to end. The trimming of the edges of the cleft should be left till now to avoid bruising and contamination of the raw surfaces. It is generally unnecessary to cut anything off the edges of the hard palate, but a broad strip of mucous membrane must be removed from the soft. This is best done with a very sharp knife, the palate being made tense by a fine suture passed through each half of the uvula, and held by the assistant; this suture is also a great help in keeping the palate taut during the sewing up.

Suturing is best done with Lane's cleft-palate needles and needle-holder, and the suture material should be the finest ophthalmic silkworm gut. On no account should silk or catgut be used. The suturing starts at the front, the greatest care being taken to see that the edges of the hard palate are well everted and that the stitches are not tied too tightly. The stitches should be about ¼ in. apart, and should be continued round the uvula for some distance on to the back of the soft palate. At one time I used in addition a continuous suture along the dorsum of the cleft throughout its length as an aid in securing eversion of the edges of the hard palate, but I have given this up as unnecessary. The mouth is now carefully cleaned of dried blood, &c., by small gauze mops wrung out in saline, the suture line is painted with Whitehead's varnish, and the gauze removed from the lateral incisions, though if there is any oozing from them small gauze plugs without adrenalin may be left in, but must be removed within 12 hours.

In a complete single cleft no attempt is made to join the alveolar margin, and in double cleft there is a space left behind the premaxilla. In neither case is it a matter of importance from the point of view of speech or swallowing; for the space rapidly closes in, and in any case patients with complete clefts generally have to wear a small plate on account of the irregularity of the incisor teeth.

This method of operating most usually results in complete union with a good movable soft palate. A failure from an acute flare up of sepsis occasionally occurs and at present appears to be unavoidable; it is common to all types of cleft-palate operations.

Summary.

Best age from 1 to 3 years, depending on type of cleft. Careful attention to the preliminary cleansing of the mouth. Removal of tonsils and adenoids in every case; not less than four weeks before operation. Perfect flaccidity of the two halves of the palate, secured by long lateral incisions commenced on the lower jaw and carried up outside the soft palate and as far forwards as necessary. Meticulous care in sewing with fine silkworm gut which is non-absorbent and is not absorbed. No tension sutures.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

NON-TUBERCULOUS COXITIS.

A MEETING of this Section was held on April 7th under the presidency of Mr. H. A. T. FAIRBANK.

Mr. ALAN TODD opened a discussion on the Differential Diagnosis of Non-tuberculous Coxitis in Children and Adolescents. He said that not long ago practically all painful affections of the hip-joint in young people were assumed, sometimes on slender evidence, to be tuberculous, and the rule was to treat them on that assumption. Gradually careful observation showed that a number of cases could not have been due to tubercle, as their behaviour did not accord with the course of that disease. A strong confirmation of this view was afforded by a study of skiagrams, and it was evident that there occurred such non-tuberculous conditions as coxa vara, Perthes's disease, and cystic formations in the upper end of the femur. There still remained a large class in which more exact definition and classification were needed. When the London County Council decided to send crippled children to various centres, and a month's quarantining was established, it was found that some of the children who were thought to have tuberculous disease of the hip got well in six weeks. It could of course be argued in regard to those cases that the diseased condition had been merely patched up, and that there was a liability for the disease to break out again, with disastrous results. The late Prof. Howard Marsh pointed out the importance of activating cases of suspected tuberculous disease, and of refraining from splinting them, for splinting would cause the symptoms to abate, and the patients might be sent away untreated until a serious relapse occurred later; whereas if the children were allowed to run about for 10 or 14 days the diagnosis would become obvious without risk having been run. A number of cases watched for long periods were found to have got well and to have remained well, indicating that they had never been tuberculous. Some 10 per cent. of the cases sent by doctors as possibly early tuberculosis were non-tuberculous, while in private practice, owing to symptoms being noted earlier and their significance being more realised, the percentage was higher.

Classification of Cases.

Mr. Todd's object was to direct special attention to the non-tuberculous cases, so that a comparison of studies and experiences might lead to a more extensive and exact knowledge concerning them. He said non-tuberculous coxitis in children and adolescents was divisible into five categories: (1) traumatic; (2) coxa vara; (3) infected cases; (4) Perthes's disease; (5) miscellaneous. In the traumatic transient coxitis the child had probably had a fall a few days previously, and complained of pain on movement and limitation of movement in various directions. Some got well spontaneously. Some of these patients complained, in addition, of a dull aching pain, and there might be very acute pain at a particular stage of one movement. When that was so, he thought a patch of articular cartilage had been bruised and acutely inflamed. Cases of acute traumatic chondritis got well after a few days' rest in bed with splintage. In some there was a recurrence of symptoms after a few days of running about, and after a time some wasting was noted. He had not seen a case of tuberculosis of the hip which became obvious within six weeks of a local injury, or as the result of a severe blow on the hip. Usually the injury which precipitated tuberculous manifestation was a slight, not a severe one. In juxta-epiphyseal strain the upper epiphysis was rarely separated, and this was demonstrable by skiagram. If there was suspicion that this region had been strained, the case should be kept under observation and X rayed periodically for some months afterwards, as coxa vara might develop. Group (2), coxa vara, could always be distinguished from tuberculous disease by X rays. In an early stage of coxa vara adduction alone was limited, whereas in tuberculosis there was limitation in more than one direction. Some of the cases in group (3) directly followed various febrile conditions, such as pneumococcal lesions, measles, scarlet fever, typhoid, influenza and, in children, gonorrhœal vulvo-vaginitis. Others followed surgical conditions, such as tonsillitis, otitis media, operations on tonsils and on appendicular abscesses. Some of the hip conditions here were probably microbic, but a number were merely toxic apart from micro-organisms. Scarlet fever rarely caused coxitis, but when it did the degree was severe, and there might be ankylosis, either with or without suppuration. Measles was followed by coxitis fairly often, and the arthritis owning this cause was fairly mild. If these cases were splinted, the arthritis usually subsided in two months. Broca had mentioned that in some cases of coxitis, not necessarily microbic, there was a marked flattening of the femoral head. Whether the pneumococcal cases were primary or secondary, as both were blood-borne infections, he did not think the differentiation was material. Thirty per cent. of these cases occurred in children under 14 years of age; they had acute pain, but swelling was slight. There were high fever, delirium, and even mania. The teeth, throat, conjunctivæ, and middle ear were some of the most important foci of infection in this condition.

In coxitis secondary to acute or subacute epiphysitis the onset was sudden and the course rapid; there were marked hyperpyrexia and prostration, and in a few days the X rays revealed gross changes in the joint. This and the marked leucocytosis demarcated it from tuberculosis. Coxitis in an infant under a year old was more likely to be non-tuberculous than tuberculous. In Still's disease and in Perthes's disease the diagnostician had a definite cycle of changes to guide him. Among the miscellaneous cases Mr. Todd gave some attention to hæmophilia, which led to recurrent attacks of pain and limitation of movement. A few weeks in bed usually caused these to subside, and confirmation of the diagnosis arose from X ray examination and the effect of special treatment. A pseudo-coxitis occurred in children who suffered from dyspeptic troubles, including constipation, their pain being definitely referred to the hip-joint. But there was no muscular wasting in these cases, nor definite limitation of movement. Careful dieting and giving a non-protein diet brought about a rapid cure.

In regard to the general differentiation of tuberculous from non-tuberculous cases, Mr. Todd stressed the need for a careful study of the patient's normal temperature variations, and the changes induced by specified amounts of exercise. After the latter the ordinary child would not show any change, but the tuberculous patient would have a rise of temperature half an hour after the exertion. Sir William Hale-White long ago pointed out that in tuberculous cases, at a very early stage, the pulse-rate was accelerated out of proportion to the temperature rise, and the speaker confirmed that; he had not found this in any other conditions. He thought it would be valuable to discuss this topic again in about two years' time, when accumulated experiences on the lines mentioned might lead to the subject being placed on a more firm basis.

Need for Accuracy in Diagnosis.

Mr. R. C. ELMSLIE said he had seen quite recently cases of obvious coxa vara diagnosed, and treated for two years, as tuberculous hip. There was need not only for a greater accuracy of diagnosis in these joint conditions, but also for a more general and thorough dissemination in the profession of the knowledge already acquired. The differentiation of coxa vara from tuberculous hip was first made, without the aid of X rays, on clinical data, in 1881. In a large series of cases of coxa plana, not one suppurated, whereas 70 per cent. of tuberculous cases ended in external suppuration. Radiographic appearances in tuberculous disease of the hip varied so greatly that probably no one had a clear picture in his mind as to what appearances to expect in that disease. Even when cases cleared up there might be reason to suspect they might still be tuberculous. One supposedly tuberculous case he found had simply a cyst in the neck of the femur. Mr. Elmslie said the only way in which progress in this matter could be ensured was by a careful collection of clinical and radiographic observations of both tuberculous cases and other conditions which simulated them. He thought tubercle was such a frequent sequel to measles because the latter disease so lowered the general bodily resistance. He referred to the reports made occasionally of supposed success of a particular treatment in tuberculous cases, when there was grave doubt whether the cases were ever tuberculous. He hoped Mr. Todd would write descriptions of the various types of cases he had encountered, as a guide to others faced with difficult conditions.

Mr. A. ROCYN-JONES narrated some cases of difficulty which he had encountered, one being that of a child who had broncho-pneumonia, and soon after this cleared up both hips became swollen. When he saw the child some months later there was a scar over each hip, and the radiographic appearances were like those of tubercle; but it was shown not to be tuberculous. He thought it was very risky to depend on the radiogram; this must be taken with the history and the clinical course. A valuable sign of an early intra-articular lesion was the production of pain on performing rotation of the limb, though abduction and adduction might cause no distress.

The PRESIDENT said synovitis of the hip-joint due to trauma was apt to be forgotten. In doubtful cases his practice was to allow the child to walk about for a time, though if it was acute there must be periods of rest. If it was a mild case and not tuberculous, the rule was for the condition to clear up absolutely. Tuberculous synovial disease was very rare; there were two specimens of it at Great Ormond-street Children's Hospital. Both those patients came with subluxated hips, and there were no definite X ray signs apart from the dislocation, no erosion of acetabulum or head, and therefore they were not congenital dislocations. Both died of tuberculous meningitis. He was not familiar with the condition of juxta-

epiphyseal strain apart from definite displacement of epiphysis; usually, he thought, there would be detected a small displacement of the head. With regard to endocrine disorders, Mr. Fairbank said a certain number of children with displacement of the head of the femur were slow in development, and sexually they were definitely behind the normal. The infective group of cases were most difficult to diagnose definitely. He blamed the *Staphylococcus aureus* for many of the puzzling and obscure cases. In Still's disease there was often trouble in the articulations of the cervical spine. Hip trouble which was primarily pneumococcal seemed to respond well to opening and washing out.

Mr. WHITCHURCH HOWELL said that during his association with an infectious fever hospital of 500 beds he only operated on three cases of arthritis in children, and in those, all under 3 years of age, it followed scarlet fever. One of them re-established complete range of movement, another had subluxation following and was walking with the aid of a calliper splint, while the third was stiff, short of ankylosis. Broca, in his last book, was emphatic that all cases of arthritis following measles were tuberculous.

Dr. KNYVETT GORDON, speaking as a pathologist, referred to the value of hæmological examination, not a mere blood count. Tuberculous cases invariably gave a blood picture differing from that of infected cases. In closed tuberculous cases (those having no sinuses) there was a leucopenia, with relative lymphocytosis, while in infective cases there was a polymorphonuclear predominance. There had been a remarkable reduction of cases of suppurative hip disease since mastoid operations were done in fever hospitals. He considered that bacteriological examination only was of little use for diagnosis; it should be followed by inoculation into a susceptible animal. Fluid from a tuberculous joint was usually sterile from an ordinary examination, but it killed a guinea-pig.

WAR SECTION.

A MEETING of this Section was held on April 6th, Surgeon Vice-Admiral JOSEPH CHAMBERS, the President, being in the chair.

Colonel J. CRAWFORD KENNEDY opened a discussion on

TUBERCULOSIS IN THE SERVICES.

He dealt with the matter from the statistical side, basing his work on the earlier reviews by Melville and Simpson. There appeared to be no detrimental influence in foreign service, the incidence of tuberculosis among soldiers being approximately the same at home and abroad. Between 1860 and 1906 there had been a very marked improvement, the total loss from tuberculous infection dropping from 9·2 to 2·2 per 1000. The factors underlying this were improved housing and surroundings; to a certain extent a lowering of the age of the army and changes in nomenclature might also have contributed. During those years there had been an improvement in the civil population of 50 per cent., while the improvement in the army was 80 per cent. In 1860 the death-rate was 9 per 1000, in 1914 it was 1·6; in 1921 it had risen slightly to 2, where it had remained steady. While better rationing, better housing and conditions of life, improved medical and general physical supervision, and more careful recruiting might all be mentioned as contributing factors, none of them was sufficient to account for the change, and it was to the reduction of the disease in the civil population that we must look for an explanation of its reduction in the army. Comparing the statistics, it was found that there was a slight balance in favour of the service up to 1914 and in favour of the civil population since 1921. The rejections for tuberculosis from recruiting stations were on the whole increasing, especially since recruiting began to tighten up in 1921 after the rather more lax regulations of the post-war years. It must not be forgotten that the material presenting itself for recruitment in 1920 was that which had suffered from war malnutrition at the most susceptible period of life—viz., 14-16—and was therefore more likely to develop subsequent infection. The wastage from tuberculosis had remained at a steady figure since 1912. The greatest incidence of the disease was seen between the fifth and tenth year of service, the figure being 4·4 per 1000; in later decades the figure was 2 or 3 per 1000, while during the first five years it was only 0·86. The curve for the age incidence rose steadily, reaching its maximum at 40, unlike the curve in civil life. The ratio of liability in the army to that in civil life had been as 1 to 7; it was now as 1 to 4, and thus there appeared to be a process of approximation taking place. In conscript armies on the continent the incidence was much higher.

Surgeon-Commander C. H. DAWE spoke of

Tuberculosis in the Navy.

Between 1891 and 1904 the incidence had been highest at the middle period of life, since then it had become higher in the young adults and much lower in the middle decade, while remaining about the same for the older men. Economic status and hygienic conditions had little effect on the young adult type; the problem of tuberculosis between 10 and 30 years of age was a problem of feeding. In the navy the rate followed that of the civil population. The life at sea was far from being ideal, but the efforts made to overcome the difficulties of diet had resulted in the marked decrease of the tuberculosis incidence in the decade 30–40. Malnutrition had little influence on the development of the disease in the later decades; that was a problem of wear and tear. There had been rather more tuberculosis in the navy in 1919–22 than in 1913; this was probably due to the results of malnutrition during the war period. Something might be done to make the change in environment less sudden and trying for some of the young recruits. The incidence in merchant seamen corresponded to that of naval men up to the age of 30 and then increased steadily with age. This was due to the wear-and-tear factor and the poorer hygienic conditions in the merchant service.

Wing-Commander H. A. TREADGOLD said that the statistics of

Tuberculosis in the Air Force

were of necessity few, but such as they were they confirmed the findings of the army and navy. There appeared to be no difference in the incidence of the disease in squadrons abroad and in those at home. This was strange, as the total sickness incidence was very much greater among the men on foreign service; they were subjected to much more trying conditions of climate, dust, and absence of fresh foods, and, although there were no figures, the general impression was that the incidence in the civil populations of the occupied regions was very high. The probable explanation was that the men abroad did not come into intimate contact with the infected civil population in the way that men at home did.

A paper by Fleet-Surgeon W. E. HOME giving the

Statistics in the Mercantile Marine

was read by the Secretary. In the year 1921–2 only one case of tuberculosis died in a sailing ship; the incidence in steamships was slightly higher, the lascars being more affected than white races. He quoted Sir William Osler's opinion that the tuberculous soldier brought the disease into the service with him.

Surgeon-Commander R. J. MACKEOWN agreed with this dictum and expressed the opinion that the standard of recruitment should be raised. He asked if recruiting medical officers examined the urine, investigated the history, especially of frequent colds, and cross-examined the patients as they should. It

was not uncommon to find men in the services who had previously been in sanatoria. Every case of pleurisy should be looked on as a certain case of future pulmonary tuberculosis and removed. It was useless to send such cases back to the hardships of naval life after patching-up in hospital. He asked whether naval medical officers fully realised the dangers of early tuberculosis occurring in a crowded mess deck. The artificial means of aerating between-decks helped to spread infection if any was present. Something should be done to eliminate dust; the institution of vacuum cleaners would be of advantage.

Wing-Commander A. V. J. RICHARDSON referred to the dangers of dust. He asked whether the cases occurring about 25 were really primary infections or whether they were not due to the lighting up of an old infection.

Surgeon-Commander J. O'HEA said that the recruiting medical officer could hardly do more than examine the chest fully and exclude all cases of abnormality of any sort. The urine was tested in every case and the history investigated as far as possible, but it was difficult to elicit. Men would often say they had had no illnesses and had never been in hospital, and yet would admit that they had undergone a period of sanatorium treatment if that question were specifically put. All men who had had pleurisy or been exposed to a massive infection at home were rejected.

Surgeon Vice-Admiral Sir ROBERT HILL asked which ratings of the navy were most severely attacked by the disease. The limited sleeping accommodation must be accounted one of the chief causes of its spread.

Squadron-Commander J. MACDONALD spoke of the thorough examination carried out on recruits for the Air Force. The history could not be relied on, but any suggestion of tuberculosis was investigated. He asked whether X rays might not help in the assessment of the lung of the recruit.

The PRESIDENT said that every possible precaution was taken in the navy to detect early cases; there was periodical examination of the chests of all men and any doubtful case was sent to hospital for X ray examination. Reports were required as to the name of such cases, place of station, family history, rating; as to employment between decks, with particulars as to the ventilation of the deck concerned, a list of the ships in which the men had served; and information as to the general health of those ships and previous cases reported from them. Vacuum cleaners were being installed, and many other improvements designed to raise the standard of naval hygiene were in view.

Colonel CRAWFORD KENNEDY, in reply, said that careful recruiting had already eliminated the young-adult tuberculosis of the soldier. The cases which appeared between 35 and 40 could not possibly be eliminated by the recruiting medical officer. He did not think X rays would be of much use; the soft type of tuberculosis could not be recognised on the film and the fibrotic type seen there might never break out again. The Americans used X rays a good deal, but insisted that only a stereoscopic view was of any value. That the factor of intimacy with the civil population was one of importance was evidenced by the fact that the incidence was particularly high in the Armies on the Rhine.

Surgeon-Commander DAWE pointed out that 60 per cent. of naval recruits entered between the ages of 14 and 16, when the tuberculosis incidence was very low. The rates for seamen and stokers were identical, that for the marines slightly higher. The ratings varied from year to year in the number of cases reported. An exhaust system of ventilation would probably be more satisfactory than the present supply system.

Reviews and Notices of Books.

ANTHROPOLOGY.

The Origin of Man. By CARVETH READ. Cambridge University Press. 1925. Pp. 100. 5*s*.
Man and His Superstitions. Same author and publishers. Pp. 278. 12*s*. 6*d*.

THESE two books form together a second edition of "The Origin of Man and of His Superstitions," which was originally published in 1920. They have now been separated with some advantage, for in the first those who are chiefly interested in man's physical development may read, at a surprisingly moderate cost, a most interesting account of the ideas of the late professor of philosophy and comparative philology at University College as to how man comes to be so different from the anthropoid apes.

Prof. Read's theory is, briefly, that early, let it be called pre-human, man got a taste for animal food and took to hunting in packs like wolves. In this way his legs developed in comparison with his arms, he left the forest and took to running in the open instead of shuffling about in and under the trees. To hunt successfully needs numbers and organisation, and hence these men came to form considerable communities which were under the control of those who were marked out as leaders by their obvious success in the chase. Emerging from the same stock the ourangs and chimpanzees have made much less progress because they have not faced such difficulties, and from the lower apes, which often live in communities, they have developed into solitary or at most familial groups content with vegetables and more apt at defence than attack. The pack must be clearly distinguished from Mr. Trotter's herd, aggregated for mutual comfort and protection: *Lycopithecus* was like a wolf rather than a deer, which may explain, among many other things, the foul savagery which, as medical men know better than most, is in us all. Prof. Read's exposition is singularly clear and readable, punctuated with many wise and witty remarks, and he puts his case with a persuasive moderation which leaves his thesis among that delectable list of topics which can be discussed for ever and never solved.

In "Man and His Superstitions" the author carries on his account of how the wolf pack grew into a settled human society. So long as the pack hunted, empirical success in getting food indicated who was the leader by considerations which made a convincing appeal to everyone's stomach. But when they grew so skilful in the chase that they had time to think of kennels, so to speak, all the problems of the leisured human life began to arise and not least among them the problem of government. In Prof. Read's view, there were men shrewd enough to make use of the beliefs in magic and animism, which were then appearing on the human horizon, to give them prestige enough to maintain the necessary custom and tradition: the chief huntsman was replaced by the magician, who in turn grew into a wizard-king or a priest-king or a king supported by wizards and priests. Hence the fundamental importance of superstition in the subsequent development of man and hence its prevalence to-day. The author discusses then magic, animism, wizards, omens, totemism, and all the allied vagaries, as they seem to us, of the human mind. It is a very strange tale and makes us wonder whether we are really much more rational than the Australian natives described by Spencer. Prof. Read seems doubtful and of the future he will hazard nothing.

CHRONIC APPENDICITIS.

Les colotyphlites et le syndrome de la fosse iliaque droite. Par le Docteur A. C. GUILLAUME. Paris: G. Doin. 1924. Pp. 386. Fr.35.

MOST surgeons will be agreed as to the extremely unsatisfactory nature of "Chronic Appendicitis" as a diagnosis. It is true that occasionally the removal

of a fibrotic appendix produces a remarkable cure, but too often a temporary relief is followed by recurrence of all the former symptoms. Pain in the right iliac fossa is one of the commonest complaints, but Dr. Guillaume is so impressed by its doubtful pathology and the extreme uncertainty of a precise diagnosis that he simply describes the condition as "the syndrome of the right iliac fossa." From this standpoint he discusses the many possible pathological conditions which may be associated with this syndrome, and although he arrives at no very definite conclusion the monograph is of considerable value. It consists for the most part of a critical examination of the literature of the subject, and the thoroughness of his research in this direction may be gauged by his bibliography which extends to over a thousand references. Criticism throughout is trenchant and well founded, and he illustrates his views by numerous examples drawn from his own practice. The book should be of real value to students of intestinal stasis and of chronic abdominal pain.

THE DEGENERATIVE DISEASES.

By LEWELLYS F. BARKER, M.D., Professor Emeritus of Medicine, Johns Hopkins University; and THOMAS P. SPRUNT, M.D., Associate in Clinical Medicine, Johns Hopkins University. London and New York: Harper and Brothers. 1925. Pp. 254. 15*s*.

THE progressive campaign for health which has been one of the most striking achievements of the first quarter of the twentieth century has tended to concentrate its efforts on the communicable diseases and lately upon the ante- and post-natal care of the child. A study of the mortality statistics shows that certain chronic diseases of later life still continue their ravages unchecked. In this recent addition to the public health series edited by Dr. Allan J. McLaughlin, Prof. Barker and Dr. Sprunt show how these degenerative diseases may be added to the field of public health activity. "Obviously," they write, "from their nature, the degenerative diseases of senescence cannot be prevented except by the barbarity of destroying life before this stage has been reached. Indeed, one ideal of preventive medicine might be to prevent all other diseases and to permit all men to die in the fullness of years a 'natural' death from some degenerative condition. The problem of hygiene in regard to this field is to postpone the inauguration of the degenerative change, to retard its progress, to avoid, if practicable, certain expected complications, and to promote as far as possible the comfort of the patient." Such a problem will be solved by intelligent coöperation between the health worker and the community, and the aim of this book is to educate "that highly intelligent group of people made up of physicians, lawyers, clergymen, teachers, social workers, clubwomen, business men, business women, and others who are leaders of thought and opinion."

A popular book on health should be interesting, it should present the facts without prejudice, and persons of ordinary intelligence should be able to grasp the significance of the facts thus put before them. This book fulfils all these conditions. It begins with a section on the general considerations of the causes of these degenerative diseases and the rôle of heredity and environment in their production. The principles of prevention and postponement of these diseases are then set out with reference to eugenic and euthenic factors, and in the latter connexion due stress is laid on both external and "internal" environment. The subdivision of internal environment denotes the influences playing upon the organs and cells of the body arising through the activities of other cells or organs of the same body, and it serves to link up the external influences of air, food, and water, for example, on the one hand and the products of disordered metabolism on the other. The third section, comprising about one-half of the volume, deals with the special degenerative diseases. Portions dealing with auto-intoxication, focal sepsis, alcohol and tobacco, and the endocrine organs are in particular marked by a sane and restrained attitude: the facts are presented with a complete absence of the sweeping dogmatism so common in books of this nature. If the chapters on the special diseases appear a little more technical than one would have expected it must be remembered that the authors have written this book for a particularly intelligent section of the community.

ELECTRO-THERAPEUTICS.

Die Diathermie. Fourth edition. By Dr. JOSEF KOWARSCHIK, Primararzt und Vorstand des Institutes für physikalische Therapie im Kaiser-Jubiläums-Spital der Stadt Wien. Wien und Berlin: Julius Springer. 1924. Pp. 231. M.129.

SINCE the appearance of the preceding edition of Dr. Kowarschik's work on diathermy in 1921 the therapeutic field of diathermy has been considerably widened. The present edition has been enlarged by the addition of 65 pages and 19 illustrations. To the section dealing with the non-surgical uses of diathermy the author has added accounts of his own experience and that of others in the treatment of diseases of tendon sheaths and bursæ, of anterior poliomyelitis and paralysis, of occupation neuroses, of exophthalmic goitre, of vaso-motor disorders, of diseases of women, and of certain affections of the skin; the last named include varicose ulcers, frost-bite, scars and chronic ulceration caused by X rays. The author is convinced of the value of diathermy in the treatment of amenorrhœa and dysmenorrhœa (when there is no organic disease of the pelvic organs) and of chronic inflammation of the uterus and its appendages. The section dealing with surgical diathermy has been enlarged, though scarcely in proportion to the importance of the subject or the space allotted to other branches of the treatment with which the book deals. In the section on electro-technics are given particulars of diathermy machines which were not described in the previous edition. One of these is a model by an English firm. The principle of the production of sustained high-frequency currents with the aid of the hot cathode valve is described. Dr. Kowarschik's work has thus been brought up to date. It gives a brief though concise account of the subject of diathermy, and the author makes no undue claim for its therapeutic value. The book is well printed and clearly illustrated, and a full bibliography has been added.

PATHOGENIC MICRO-ORGANISMS.

Eighth edition. By WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College; ANNA WESSELS WILLIAMS, M.D., Assistant Director of the Bureau of Laboratories of the Department of Health; and CHARLES KRUMWIEDE, M.D., Assistant Director of the Bureau of Laboratories. London: Baillière, Tindall and Cox. 1925. Pp. 811. 30*s*.

THIS text-book, which has long been a standard American work on bacteriology, has been considerably enlarged and to some extent rearranged. The book, however, retains its familiar form and those features which have given it a well-deserved popularity. It is becoming, each year, more and more questionable if it is desirable to include a large section on methods in general text-books, since these are now so thoroughly dealt with in separate publications. In this book some 80 pages, or about a tenth of the volume, are occupied by this subject. It would be a pity altogether to lose this section, as it is ably written, but its separate publication might be worth considering since the size of the volume is steadily increasing. This edition includes a summary of all the recent advances in bacteriology, including the d'Herelle phenomenon, the work of Olitsky and Gates in

influenza, and of George and Gladys Dick and others in scarlet fever, as well as Prof. Park's own most recent results in active immunisation against diphtheria. The section upon immunity and the serum reactions still remains one of the best in the book. The general get up and binding are perhaps not quite so pleasing as in earlier editions and some of the blocks are showing signs of wear.

The book still remains one which, being based upon wide experiences, can be safely recommended as authoritative and trustworthy.

THE LABORATORY BOOK OF DAIRY ANALYSIS.

Third edition. By H. DROOP RICHMOND, F.I.C., Chief Analyst to Boots Pure Drug Co., Ltd.; late Analyst to the Aylesbury Dairy Co., Ltd. London: Charles Griffin and Co. 1925. Pp. 118. 5s.

THIS laboratory guide to all the common analytical processes likely to be encountered in routine dairy-work has reached its third edition. We are happy to repeat the statement made in these columns in respect of the last issue—namely, "the book is the best contribution on the subject that has yet appeared in the English language." For a laboratory guide to technique the volume could be held up as an example to other authors about to write a book on similar lines. The descriptions are very brief, and although no word is wasted, the accounts are complete and workable. Logarithm tables, and an account of the "Dairy Scale" are included to simplify calculation. The book is divided into six chapters dealing with introductory matter, the analysis of milk and of its products, and their applications, and of butter and cheese. In an appendix the methods for the preparation of standard solutions have been described.

Medical men responsible for chemical pathological routine work in general hospitals have probably not been regarded as an audience by the author, but workers in this field are often confronted with problems involving milk analysis, and are frequently questioned as to whether a certain dried preparation is made by the roller or by the spray process. The medical chemist has also to analyse human milk, which is quite a different problem from cow's milk. Mr. Richmond might bear these points in mind when he prepares his fourth edition.

DR. CHAVASSE'S ADVICE TO A MOTHER.

Nineteenth edition. Revised by G. T. WRENCH, M.D., Past Assistant Master, Rotunda Hospital, Dublin. London: J. and A. Churchill. 1925. Pp. 346. 2s. 6d.

THE fact that this well-known little book has reached its nineteenth edition and its 370th thousand is sufficient testimony to its value, proving that it is easily understood and essentially practical. The chapters on the feeding of infants have been rewritten and certain other portions revised in accordance with the recent progress of medical science. Dr. Wrench advises, in his preface, that a mother should familiarise herself with its contents so as to be able to turn to the section she requires in time of need. A good index facilitates this. The new portions are quite in keeping with the modern teaching on infant feeding, and most of the methods recommended have been extensively tried by the reviser.

BIOLOGY.

A Text-book of Biology. Fifth edition. By W. M. SMALLWOOD, Ph.D. London: Baillière, Tindall and Cox. 1925. With 249 text figures and 3 plates. Pp. 393. 16s.

THE author is professor of comparative anatomy in the Liberal Arts College of Syracuse University, New York, and his book is intended "for students in general, medical, and technical courses." The first 113 pages are given to a study of the anatomy and physiology of the frog, the next 49 to unicellular organisms: there follow a few more "types" and then 132 pages on theoretical interpretations, evolution, genetics, adaptation, parasites, and so on. The plan is unconventional and is perhaps a good solution of the difficult problem of devising a satisfactory course in biology for the arts student: it has evidently met with approval. Our criticism of its execution in this particular case is that the treatment is not disciplinary enough: familiarity with all the contents would give a facility to talk about biology in its most modern aspects, but it would guarantee no sound knowledge of its fundamentals. There is too much about Mendelism and death-rates from infectious diseases and too little comparative anatomy. The miraculous X Y Z often seems to be preferred to the majestic A B C in American education. Let it be admitted that the preference has its drawbacks, it also has its virtues.

Biology. By PATRICK GEDDES and J. ARTHUR THOMSON. London: Williams and Norgate. 1925. Pp. 254. 2s. 6d.

EVERYONE will welcome the active resumption of the splendid Home University Library, though it must be confessed that this will hardly rank as one of the best volumes. To write on biology in a small compass is obviously a difficult task, and one asking for a nice selection of the topics which are to be dealt with and the readers who are to be addressed. The authors have devoted their space to a very generalised treatment and have written in such a style that no one without a tolerably good knowledge of zoology and botany will be able to understand all the casual and implicatory references which abound. And technical equipment will not guarantee that readers will always understand what is meant. There is in many parts a vagueness about the argument, sometimes about the individual sentences, which raises a little suspicion that the authors have not defined clearly to themselves what they intend to convey. The chapter, for example, entitled "What is Life?" reads pleasantly enough until one attempts a mental summary. Biology is of course in parts a vague sort of subject, and great mysteries no doubt need mystical treatment. But in parts it is precise enough, and a greater proportion of the commonplace would not have seriously dimmed the prevailing tone of the book, which is a buoyant optimism that the world is a wonderful place and a harmonious whole in which the amœba and town-planning both have their related places. Perhaps, too, the authors have found the difficulty which is a constant obstruction to progressive minds—the fact that the evolution of meanings is always in advance of the evolution of words.

JOURNALS.

TROPICAL DISEASES BULLETIN.—The issue for March, 1925, is full of useful information, of which Dr. C. M. Wenyon has supplied the greater portion. He has reviewed the recent literature of relapsing fever and other spirochætoses, rat-bite fever, and infectious jaundice. To kala-azar there are devoted some 49 papers, of which those dealing with the transmission of the disease by the sandfly—*Phlebotomus argentipes*—by R. Knowles, L. E. Napier, and R. O. A. Smith, are the most important, for it would seem that this long-contested problem is on the eve of being solved. Leprosy is adequately treated by Leonard Rogers, and tropical dermatology by W. Jenkins Oliver. There is a review of recent articles on rabies by A. G. McKendrick which will be found opportune.

THE monograph entitled General Systematic Bacteriology, by Prof. R. E. Buchanan, reviewed in THE LANCET of April 11th, is obtainable in this country from Messrs. Baillière, Tindall and Cox.

THE LANCET.

LONDON: SATURDAY, APRIL 18, 1925.

IODINE IN EXOPHTHALMIC GOITRE.

THE relationships between enlargement of the thyroid, hyper-thyroidism, and the iodine content of the thyroid have given rise to much discussion and to a large volume of experimental and clinical work. As far back as 1820 it was first realised that endemic goitre was often associated with a low iodine content of the gland, and that a great improvement—if, indeed, not a complete cure—could often be achieved by the administration of small doses of iodine. It has long been known that endemic goitre has a geographical distribution, and it is probable that this is due to the fact that there is but little iodine distributed in these areas. This, however, is not the sole factor, and MCCARRISON[1] has shown that in certain conditions—especially those occurring in the sexual changes in women—the iodine requirements may be much in excess, and thus, although the available quantity of this substance may be up to the normal standard there is insufficient for the immediate needs of the patient. In many infective and other conditions, also, the available quantity of iodine cannot be utilised, and thus the patient again suffers from a deficiency.

The balance of experimental and clinical evidence supports the view so strongly held by the late Prof. KOCHER, that the symptoms of exopthalmic goitre are due to hyperthyroidism and that the administration of iodine in considerable doses in cases of simple goitre might change the picture to one of hyperthyroidism. The chemical investigations of DE QUERVAIN[2] have shown also that many of the characteristic varieties of exophthalmic goitre are associated with a high iodine content both as regards the percentage and the total amount. For these reasons it has always been considered unsafe to give iodine or iodine-containing preparations in any form of goitre in which there was evidence of hyperthyroidism. It is of interest to note, however, that in certain varieties of exophthalmic goitre DE QUERVAIN found that the iodine content of the thyroid gland was low, and often, indeed, lower than that found with colloid goitre. Last year PLUMMER and BOOTHBY[3] first put forward the view that even with hyperthyroidism there was often an insufficiency of iodine, and F. R. FRASER,[4] working at St. Bartholomew's Hospital, has found that generally the greater the hyperplasia of the gland the lower the iodine content. For these reasons PLUMMER and BOOTHBY advocated the administration of some simple form of iodine in the treatment of exophthalmic goitre. Six hundred cases were so treated, of which 43 were studied carefully. Iodine was given in the form of Lugol's solution—that is, a 5 per cent. iodine and 10 per cent. potassium iodide, ten drops daily being administered. From the result of their experiences they state that approximately two-thirds of the patients will be greatly benefited, one-quarter slightly benefited, and 1 in 20 not benefited. MASON[5] states that he has had a similar experience with Lugol's solution, but emphasises the fact that the symptoms increase as soon as the treatment is stopped. STARR, WALCOTT, SEGALL, and MEANS[6] also note the temporary character of the improvement and that in some cases no effect was observable. The observations of FRASER led to very similar conclusions. He found that in many cases there was an enormous improvement following the administration of some simple form of iodine. The basal metabolic rate and the pulse both fell considerably and the weight increased; nevertheless the patients were only relieved and not cured. Any mental upset or stress would often reproduce the exaggerated symptoms. If too large a dose were given the symptoms would be increased instead of alleviated, and as soon as the administration was stopped the symptoms would all return. HYMAN and KESSEL[7] did not agree with these findings and were of the opinion that any improvement which took place was due to the rest and general medical treatment, and that if such treatment were carried out for a period of six weeks and the iodine then administered progress was no more rapid than, if indeed as rapid as, it had been before the administration was commenced.

The article published by Dr. A. S. JACKSON in THE LANCET of April 11th now records observations carried out on 63 patients with exophthalmic goitre treated at Madison, Wisconsin. In this group of cases which were all subjected to operative treatment, there were no surgical mortalities, neither were there any medical deaths. No patient had been refused operation. The author regards the successful treatment of this group as being attributable to the use of iodine. He found that not only did the patient's condition greatly improve, but the post-operative hyperthyroidism was thereby almost entirely obliterated. Proceeding cautiously at first and giving only ten drops of Lugol's solution daily for a period of three months or longer he found that although there was marked improvement there was no clinical cure. The progress was, however, so satisfactory that preliminary operations such as ligation were reduced in number and thyroidectomy was carried out at the first stage. As time went on the dosage of Lugol's solution was increased until 30 drops a day were given up to 48 hours before operation, when the dose was increased to 40 or even 50 drops. He states that now the patients are frequently allowed to take the Lugol's solution at home and submit to operation on the morning after entering hospital. By post-operative administration the progress was rapidly increased, so that many were up and about on the fourth day and usually were allowed to leave the hospital on the fifth or sixth day, but this did not include cases with decompensated hearts and visceral degeneration. The clinical improvement in the pre-operative course is often remarkable, the rapid and almost choreic movements cease almost at once, and from nervous and anxious patients they pass to a condition of calm and quiet composure. The pulse-rate is noticeably slowed and the patients rapidly gain in strength. He states, however, that other factors are of importance in the great reduction of operative mortality, among which he would class satisfactory team-work and the performance of the operation earlier in the stage of the disease. He lays special stress upon the rapid improvement and upon

[1] McCarrison, R.: The Thyroid Gland, London, 1917; Simple Goitre, Brit. Med. Jour., 1922, i., 178.
[2] de Quervain, F.: Goitre, London, 1924.
[3] Plummer, H. S., and Boothby, W. M.: Jour. Iowa State Med. Soc., 1924, 1466.
[4] Fraser, F. R.: Iodine in Exophthalmic Goitre, Brit. Med. Jour., 1925, i., 1.
[5] Mason, E. H.: Canadian Med. Soc. Jour., 1924, xiv., 219.
[6] Starr, P., Walcott, H. P., Segall, H. N., and Means, J. H.: Arch. Internal Med., 1924, 34, 36, 355.
[7] Hyman, H. T., and Kessel, L.: Archives of Surgery, 1924, viii., 149.

the fact that none of these patients were hospitalised for an average of more than five days.

If these claims are corroborated a great advance will have been made; as yet they can hardly be accepted in their entirety. We understand that at the London Hospital this method of pre-operative preparation has been carried out for some time, and the results there obtained are almost entirely in accordance with those published by FRASER—that is to say, that there is as a general rule a great improvement following the administration of Lugol's solution, but that a small dose only must be given, the routine dose being ℥ iii. of Lugol's solution three times a day. Moreover, after a short period, often indeed after 10–14 days, the effect of the iodine solution begins to wear off and the patient relapses. If an operation has not been carried out before this the administration must be stopped, when the patient will again begin to improve. If too large a dose is given there has so far always been clear evidence of an exacerbation of the symptoms. This is usually at once shown in the rise of temperature, the pulse-rate, and even in the respirations, so that an estimation of the basal metabolic rate may not actually be necessary. Since such methods of treatment have been tried there has been no post-operative mortality, but in no case, so far, has the care which had previously been exercised in the pre- and post-operative treatment been relaxed. Thus, in no case is an operation performed the day after the patient entered the hospital, as advocated by Dr. JACKSON. Each patient is kept in bed for at least two weeks and never allowed home so early as the fifth or sixth day, although it is already evident that the post-operative reaction is very greatly diminished by the administration of the Lugol's solution. It may thus be accepted that the administration of some form of iodine not only gives rise to great temporary improvement in the patient's condition, but it lowers the mortality rate and diminishes the post-operative hyperthyroidism. Whether it will cause so great a temporary improvement that operations can be performed in absolute safety, so that the patient can be allowed back to work as shortly after operation as is claimed by Dr. JACKSON, remains for future investigation to decide.

PATENTED MEDICINE.

DURING the past few years we have frequently had occasion to discuss in these columns the broad question of payment for research, and we recently [1] quoted in this connexion the opinions of the National Union of Scientific Workers of Great Britain and of the Privy Council Committee for Scientific and Industrial Research, who alike condemned the rewarding of successful research by money prizes or by the granting of patent rights. Nevertheless, there is at the present day a definite development of the feeling that scientific discovery must eventually be protected against commercial exploitation. Just how this will be brought about is still a matter for speculation, but it is quite possible that some system of patenting, with or without royalties, may be elaborated and brought into action in the future and a fierce controversy will probably rage around these two words. Medical research is obviously to be included under the general heading of scientific discovery, and while any system of patenting seems quite foreign to accepted medical methods, at any rate in this country there have been certain developments within recent years which merit closer attention.

A few years ago the Medical Research Council investigated the various commercial preparations of pituitary extract and found that this valuable drug varied enormously in its potency as supplied by different manufacturing companies. It became obvious that some sort of control was necessary, for such biological preparations are unrecognised by the British Pharmacopœia, since, as the President of the General Medical Council has pointed out, drugs can only be included of which the standardisation can be carried out by a competent chemist. Some biological standards were obviously necessary and their control was handed over to the Medical Research Council in 1921. These standards have been welcomed by the better class of manufacturers who are left free to produce with the minimum of interference as to standardisation. The example of pituitary extract becomes important in view of what subsequently happened in the case of insulin. Here it will be remembered that the University of Toronto patented the name and the process of preparation of insulin, and the Medical Research Council accepted the patent rights in this country as a gift from Toronto. This action was criticised at the time on the grounds that it would limit enterprise and restrict experiments with insulin in this country. In point of fact, it has been abundantly shown by subsequent events that the highest interests both of the public and of the medical profession in this country were being served, for by this action a supply of pure insulin was available for use in circumstances where its action could be watched by competent observers; and on the other hand, exploiters and ignorant or unscrupulous persons were prevented from putting on the market an impure supply of the drug, which would have greatly discredited the reputation of the real insulin. The Medical Research Council has been free from the difficulties of a widely varying commercial supply, as in the case of pituitary extract, and has been able to supervise the production of insulin in a broad and liberal manner. The apprehension which was felt and very freely expressed with regard to insulin was partly due to the use of the word "patent," which conveys the idea of restriction for private gain. It has been suggested that in Germany, where many bacteriological products have been patented, the cost of salvarsan was enhanced by royalties, and in America steps have been taken in some instances by the authors of articles in scientific journals, which might have some commercial value, to protect themselves by applying for letters patent. This seems regrettable, but how else can the public be protected from the commercialisation without due restriction of new lines of research? Some form of protection may be necessary to safeguard the public as well as the researcher.

Perhaps the word "protection" is preferable to "patent" in this connexion, for here they appear to mean much the same. The question of royalties is naturally a thorny one. We gave some account of the possible development of such a system recently [2] when the proposals of Senator RUFFINI to the Committee of Intellectual Coöperation of the League of Nations were discussed. From the medical point of view the difference then pointed out which exists between literary copyright and the protection of scientific research is interesting. The hospital physician, for example, may embody the results of his clinical experience in a book for which he will be

[1] THE LANCET, 1924, ii., 1241.

[2] THE LANCET, 1925, i., 613.

paid and on the sale of which he will enjoy presumably a certain amount in royalties. No one suggests that such action is contrary to accepted medical ethics. His colleague, the pathologist, who has, we will suppose, no desire to write but who is a brilliant investigator, discovers in the hospital laboratories a specific drug for some hitherto incurable disease. Under existing circumstances some drug house will market this in the interests of the public and naturally at profit to themselves. Although both these men may be remembered by posterity for an equal number of years, this will scarcely compensate for the difference in material reward which they receive during their life-times, a difference which may probably be also appreciable in their respective incomes, even if the hypothetical event had not taken place. Nor is this futile speculation: the problem of the effective protection of the research worker and of some adequate means of rewarding him is one which demands pressing attention, and however objectionable the terms patent and royalties may sound it seems probable that some system of "patented medicine," consistent with the accepted medical principle which puts the interests of the public first, will have to be devised in the not far distant future.

SCIENTIFIC QUESTIONS IN CRIMINAL APPEALS.

WHEN the Court of Criminal Appeal was set up in 1907, Parliament equipped it with power to summon medical assessors and to refer for decision by a special Commissioner any question involving a "scientific examination which cannot in the opinion of the Court conveniently be conducted before the Court." This provision, though the Court was invited to apply it upon the recent appeal of NORMAN THORNE, has virtually remained a dead letter. The Criminal Appeal Act of 1907 says that the Court may take this course "if they think it necessary or expedient in the interests of justice," and that the reference to special Commissioners shall proceed in accordance with rules of court. The rules were duly made, but have seldom or never been brought into play. They ordain that the Court, in referring any question, shall specify the question exactly and shall name the Commissioner who is to answer it. The order remitting the matter to him may declare what powers (if any) of the Court of Appeal are being delegated. The request for the setting in motion of this machinery in THORNE'S case was rather summarily rejected. The application was described as "unparalleled," and, indeed, the whole appeal was dismissed without counsel for the Crown being called upon. The issues which it was suggested should be referred to a special Commissioner were the same medical issues as had arisen at the trial. The questions related to such matters as the existence and significance of marks upon the dead woman's neck, the extent of the pulping of the tissues, the probability or improbability of suicide on the part of an apparently neurotic patient, and so on. What was fatal to the application was just this fact that medical evidence on these very points had been fully given by experts both for the Crown and for the defence at the trial. It may be that juries are not the best tribunals for weighing and judging between the conflicting views of experts, but Lord HEWART has now made it clear that the Court of Criminal Appeal is not going to transfer to a medical referee "the determination of a question on which the jury, with conflicting views before them, has arrived at a unanimous conclusion."

In a proper case, Lord HEWART observes, the Court will use its "special and exceptional" powers of referring scientific questions to a Commissioner. We are left unenlightened as to what conditions will constitute a proper case. There can never, it seems, be a proper case for such a reference on appeal if full medical evidence has been given at the trial. The only occasion, therefore, in which a special Commissioner or a medical assessor is likely to be called in on appeal is the case where medical evidence has been improperly curtailed or rejected by the Court below, or where some medical issue arises unexpectedly after trial. We might perhaps add that the calling in of a medical assessor is the more remote so long as our official experts maintain the excellent tradition of giving evidence with impartiality and detachment, coming to be regarded almost as judicial officers of the Court rather than witnesses for the prosecution.

The Lord Chief Justice gave his judgment in the THORNE case with his accustomed clearness. The fact stands out that, if there is sufficient evidence —whether of a scientific or a non-scientific nature— upon which a jury can convict, and if a jury does convict thereon, the Court of Criminal Appeal is not going to invite anybody else to say whether or not he agrees with the jury's conclusions. The case against THORNE was essentially one for a jury. There was, says Lord HEWART, overwhelming evidence on which they might have returned the verdict they did. Once that fact is accepted, there was really no ground for the appeal, were it not that by a kind of forensic convention an appeal takes place almost automatically in all cases of death sentence. Twice lately Lord HEWART has pointed out, as he did here, that there was nothing in the appeal except the circumstance that it related to a charge of murder. Medical opinion will, we think, admit that the scientific evidence had satisfactory exposition and consideration in the Crowborough murder trial. There is undoubtedly a possibility that, if a jury's decision were lightly to be disturbed either by the Court of Appeal or by a scientific tribunal, juries might be tempted to slur their duties and to abandon the good old tradition of giving the prisoner the benefit of the doubt.

CARDIAC SURGERY ON ANIMALS IN THE FIELD.

A CONDITION described as traumatic pericarditis is well recognised by practising veterinary surgeons. Cattle especially are the subjects of this disability on account of their habit of picking up pieces of wire, knitting needles, nails of various patterns, and other foreign bodies when grazing, and as these foreign bodies are forced along during the act of rumination they have ample opportunity for penetrating the rumen in a particular place, after which they find their way into the pericardial sac, and even to the heart muscle. A number of cases in which foreign bodies have been extracted from the heart of the cow by direct operation are reported by Mr. Leslie P. Pugh in the March issue of the *Veterinary Journal*. A photograph is shown which was taken nine months after such an operation on a very valuable pedigree Guernsey cow, which made an excellent recovery; since the operation she has been giving as much as three gallons of milk daily, and is now again pregnant and in excellent health. To perform cardiac surgery successfully on a farm animal under field conditions is a totally different problem from that of performing it experimentally under the advantageous conditions available in the laboratory, and Mr. Pugh may be congratulated upon the pioneer work which he has done for veterinary science.

Annotations.

"Ne quid nimis."

CICELY NORTHCOTE TRUST.

IN a modest little document[1] of 24 pages, issued from the Lady Almoner's Department of St. Thomas's Hospital, is told the story of a side of hospital work which ought to be better known to the public; for it abundantly demonstrates that often the most efficient hospital treatment among the poor neither begins nor ends in the wards. Where help is not given, sometimes before, sometimes after admission, and sometimes at both periods, discharged patients may often drift back to hospital, with the result that previous treatment is wasted, unnecessary expenses are incurred, and deserving patients are kept on the waiting list. The activities of the Northcote Trust are concerned with the adjustment of family life caused by illness, with the provision of surgical instruments and appliances, with convalescent treatment, and with the equally important work of after-care. The report is illustrated by typical cases which speak eloquently for the work being done. One of the most important aspects of this work is connected with a hostel which was opened in 1920 as a home for women and girls suffering from venereal disease. This hostel has accommodation for 14 adults and four infants, and during the past year 44 girls and 16 babies have been in-patients. The aim of the hostel is to create for the visitors a real home where, besides receiving physical healing, the girls may learn something of their responsibilities and privileges as members of a family, neighbours in a community, and citizens. In this connexion it may be noted that Colonel L. W. Harrison recently urged the institution of a home for mothers and babies on their discharge from the V.D hostel from which the mothers could go out to work, leaving the baby under supervision during working hours. The Cicely Northcote Trust coöperates with some 70 other societies and agencies. The work is increasing by reason of the larger number of patients passing through the wards of St. Thomas's Hospital, and is also being added to by new activities of the hospital involving extension in diabetic diets and the provision of insulin. A continuous supply of this drug has been arranged for many patients. Financial help is greatly needed if the growing work of the Trust is to be done as effectively as its importance demands.

CONJUGAL TUBERCULOSIS.

DURING the last few years many important investigations into the problem of conjugal tuberculosis have been published, and the work of Dr. E. Ward and others has done much to show that, under certain conditions, the risk of infection of one partner by the other is not negligible. This is the lesson of a paper published recently by Dr. H. Tecon in *Paris Médical*. His conclusions are the more interesting as they are based on observations made not only among the institutional patients, but also in his private practice. The number of families studied was 482, and in each one partner at least was sputum-positive. In about 90 per cent. of all the cases husband and wife still shared, or had recently shared, a bed. In 50 per cent. of all the cases the tuberculous husband or wife had not, apparently, conveyed the disease in a clinically manifest form to the other partner, but this immunity was not enjoyed by the children, and as one of Dr. Tecon's family histories shows—and he records it as an example typical of many—the chances of husband or wife infecting the other partner are very much less than the chances of a tuberculous parent infecting one or more of the offspring. The chances of conjugal infection are certainly not small to judge by the following figures. In as many as 90 of the families investigated, there was evidence of the one partner having been infected by the other. In another 17 cases, infection of one partner by the other could not be so clearly proven as there were other possible sources of infection. Of the 90 cases already referred to, as many as 63 were cases of infection of the wife by the husband—in other words, as great a proportion as 70 per cent. of all the cases of proven conjugal tuberculosis represented infection of the wife by the husband. This sex difference in the risk entailed by marriage with a consumptive would seem to depend on many factors, chief among which may be the wife's seclusion throughout most of the day to the infected house; the husband in most cases spends a relatively short period of the 24 hours at home. Another factor which Dr. Tecon omits to discuss in this connexion is the wage-earning capacity of man and wife respectively; if the first partner to develop tuberculosis is the husband, the daily bread of the couple will usually be more reduced than would be the case had the wife been the first to develop this disease. A comparison of the course of the disease, according as it was conveyed by husband to wife or by wife to husband, did not indicate any great differences, and it is noteworthy that, only with rare exceptions, the site of the disease in the second partner was also the lungs. Turning from the statistics, Dr. Tecon discusses their application to the problem with which a medical man is confronted when his opinion is invited on a prospective marriage one potential partner to which is tuberculous. Dr. Tecon is wise enough not to generalise, and he recommends the discrimination which judges each case on the particular circumstances involved.

[1] Cicely Northcote Trust: Fifteenth Annual Report, October, 1923, to October, 1924.

PATHOLOGY IN GENERAL PRACTICE.

THE evils resulting from the lack of coöperation between the clinician and the pathologist are common subjects of discussion in most enlightened medical circles, but unfortunately the conversations seldom lead to any attempt to rectify the situation. In general practice in this country pathology means little more than routine examinations of blood, sputum, urine, and so forth. Only very rarely are post-mortems done in private practice, which is merely another way of saying that, except in some cases where a surgical operation is the penultimate event, the ante-mortem diagnosis is only very rarely controlled. In this matter America appears to be leading the way, for in a recent number of the *Medical Journal and Record* Dr. W. W. Waite,[1] of El Paso, Texas, reports the formation of a small society for the study of pathology by general practitioners, the objects of which deserve high praise.

Dr. Waite and his colleagues, realising that medicine cannot be scientifically followed if divorced from pathology, have formed among themselves a small group for the purpose of performing autopsies on patients dying in their practices, and for studying the material obtained thereby. The group is limited to about a dozen members, for it is felt that this is the largest number which can work round a body and see all there is to be seen, and can meet together regularly for close study. The organisation of the group is quite loose—there are no officers, though the pathologist acts as director—each member does what he can to serve the common object, and with increasing experience becomes capable of performing autopsies for himself and carrying out the further necessary investigations. Time being of importance, only brief clinical histories are given at the actual autopsies, but at the regular meetings the cases are discussed in detail. Full clinical histories are given, the pathological findings are carefully scrutinised, and microscopic preparations are projected on to a screen, a part of the proceedings which has proved to be extremely popular. The best specimens are saved, and a museum is being formed which, it is believed,

[1] Home Post-graduate Work by Means of Post-mortem Examinations, Med. Jour. and Record, Feb. 18th, 1925.

will be of real educational value. At these meetings discussion is free and pointed. Good work may be commended, but imperfect clinical histories and faulty observations are criticised without restraint. The material has been surprisingly interesting and varied, far better, the reporter states, than any he saw in hospital, and upwards of a hundred autopsies have been performed in the six months during which the organisation has been properly developed.

There is no better way to study medicine than to keep good records of cases and, when the patients die, to examine the body. Why, then, is this not more often done? In this country, at any rate, local conditions may be largely to blame. Autopsies are not easy to carry out in general practice; Dr. Waite himself confesses that in American homes it is difficult to obtain leave for their performance. But in America embalming is usual, and undertakers' establishments have to be equipped with good operating theatres which are convenient places for making the post-mortem examinations. This, however, cannot be the whole story, for by no means all the patients dying in our hospitals, even the teaching institutions, come to the post-mortem room, and the fault does not lie entirely with the general public. It is true that in a certain proportion of cases permission to make an examination is refused, but when the doctor takes the patient's relations into his confidence and explains the situation, this proportion becomes surprisingly small. The general public, no doubt, needs educating in these matters, but the medical profession is perhaps not beyond reproach. We may at any rate congratulate Dr. Waite and his friends on their achievement, and the medical schools from which they graduated on the success with which they have imbued their graduates with the true scientific spirit. Mr. Lewis Sinclair, please note.

PATHOGENICITY OF THE BACILLUS ABORTUS IN MAN.

AT a recent meeting of the Royal Society of Medicine[1] Prof. J. H. Eyre introduced a discussion on the alleged identity of the *Bacillus abortus* of Bang and the *Micrococcus melitensis* described by Bruce. Their morphological, cultural, and serological identity is well known, the striking difference between one micro-organism and the other lying, according to some observers, in their pathogenic power with regard to man—namely, that *B. abortus* is devoid of such power. Nicolle, Burnet, and Conseil made numerous experiments in this direction and inoculated five subjects with cultures of *B. abortus*, three derived from cows and two from swine. None of these individuals presented any febrile or other disturbance. According to Nicolle, the absence of pathogenicity of *B. abortus* for man would exclude infection by this organism, but further confirmation is required on this point. In the actual state of our knowledge it may probably be concluded that we do not possess data of differentiation enabling us to distinguish *B. abortus* from the *Micrococcus melitensis;* hence we cannot say certainly whether a patient, from whose blood a micro-organism is isolated which responds to the tests for both germs, is affected by one of them rather than the other. We may refer to clinical observations of cases recently verified in the provinces of Bologna, Ferrara, and Modena, in which it has not been possible to trace in the history of the patients any contact with goats, and may consider, moreover, that these cases occurred coincidently with an epidemic of epizootic abortion and were not rare in veterinary surgeons and butchers who had been in contact with affected cows. It is of interest to draw attention to two cases published by Dr. R. Viviani.[2]

The first case was that of a butcher, aged 35, whose cows in one stall had all aborted. Fifteen days previous to being taken ill he had slaughtered a sick calf in this stall. His illness consisted of fever of remittent type accompanied by sweating and splenic enlargement. He had had no contact with goats; in fact, there were none in the neighbourhood. Malarial parasites were absent from his blood, the leucocytic formula of which was normal. Agglutination for typhoid and paratyphoid was negative, that for melitensis occurred in dilution of from 1–700 to 1–1000, that for *B. abortus* 1–1000. Cultures revealed a small coccus and a short bacillus Gram-negative. The serum agglutinated this germ at 1 per cent. Agglutination also occurred with 1–1200 antimelitensis serum and with 1–1000 serum of cows affected with abortion, which also agglutinated *B. abortus* at a dilution of 1–800.

The experiments of W. E. Cotton, published in the *American Veterinary Review*, December, 1923, would seem to show that a large number of abortions in pigs were related to an aberrant type of *B. abortus*, the specific agent of contagious abortion in cows, and in this connexion the second case reported by Dr. Viviani is interesting.

The patient, a previously healthy girl, had never drunk goats' milk nor come directly in contact with them. There had been no cases of epizootic abortion in her stalls, but she had looked after a sow which had aborted some months previously. Her febrile attack lasted about two months and was accompanied by enlargement of the liver and spleen. Malarial parasites were absent and sero-agglutination occurred with melitensis in dilutions of 1–1000 and also with *B. abortus*. Notwithstanding the absence of fever at the time of examination a Gram-negative organism was isolated morphologically similar to *Micrococcus melitensis* and agglutinated by 1–1200 antimelitensis serum and by 1–1000 serum of cows affected with epizootic abortion.

The importance of the question evidently calls for further experimental researches.

[1] THE LANCET, March 21st, 1925, p. 606.
[2] Il Policlinico, Practical Section, Feb. 9th, 1925.

WOUND TREATMENT BY SUCTION.

AN article in the *Schweizerische Medizinische Wochenschrift* (Jan. 29th, 1925) by Chas. Reinert, of Bern, deals with the uses of suction in combination with irrigation in the after-treatment of suppurating wounds and cavities. The principle underlying the treatment consists in the continual slow irrigation of the wound with some suitable antiseptic or saline lotion, and the immediate removal of the discharges by slow continuous suction. The apparatus used consists of two independent parts arranged on the same stand, the one for irrigation and the other for suction; either may thus be used separately when the combination is not required. The suction part of the appliance bears some resemblance to the Cathcart pump for use after cystotomy, and consists of two large glass bottles connected by a drip-feed to regulate the flow from the upper to the lower. The suction tube is attached to the top of the upper vessel and is led to the wound via a smaller collecting bottle. By means of a by-pass valve the used water in the lower bottle can be pumped by hand into the upper vessel again and the suction thus made continuous. In addition, the author has modified Bier's suction glasses in such a manner that the wound is irrigated and the discharges withdrawn, while a negative pressure is kept up within the chamber the whole time. By attaching this apparatus to a small glass cup from which a tampon of gauze extends down into the depths of the wound he has also been able to combine suction with capillary attraction. The total energy available is very small, and, as can easily be appreciated, the negative pressures produced are low and equal only 2 or 3 inches of water. The author considers that the latter is an advantage as no possible damage to delicate granulation or other tissue can occur. At the same time it must be borne in mind that the discharges from wounds are oftentimes thick, fibrinous, and viscid, and, even although the irrigating fluid may thin them to some extent, a negative pressure of a few inches of water only will be insufficient to move them along the collecting tubes. Again, if there be the slightest air leakage around the sides of the wound no suction will be exerted upon the discharges and the apparatus will merely aspirate air. The author makes the suggestion that where more rapid suction is needed the water

be allowed to flow freely from one bottle to the other by short circuiting the drip-feed. This can only be used during the actual dressing of the wound, for the increased degree of suction must of necessity be of short duration. The use of low degrees of suction in the continuous drainage of wounds bears little relationship to the use of suction in actual operative work. Here the degree of suction must be considerable in order to remove thick discharges, and especially blood, from the field of operation. The total amount of energy available, too, must be large if the blood is to be removed rapidly enough to be of real assistance to the operator. These desiderata cannot be achieved by a pump such as the one described by Reinert, but may be met by especially designed pumps drawing their energy from the electric supply, such as the reciprocating and rotary pumps, from the water-supply, as in the Sprengel pump, or cylinders of compressed gas, as in Norman Lake's pump described in THE LANCET (1924, ii., 1166). Each of these will work satisfactorily, and the choice of pump ultimately depends chiefly upon portability, ease of operation, and expense. As would be expected, however, none of these operating pumps are suitable for the continuous drainage of wounds or cavities. A small pattern of Lake's pump has, we understand, been made to work for one hour off a 60-gallon cylinder maintaining a negative pressure of about 10 inches of water, but even so the expense and frequent changing of cylinders render it unsuitable for really continuous suction. For this purpose, therefore, the pump described by Reinert may be of value. While operative suction is a method which is being used more and more extensively by workers in every branch of operative surgery, the question of the real advantages to be derived from continuous irrigation-suction over other methods is one about which many will still be inclined to reserve judgment.

INTERSTITIAL KERATITIC NODULES IN TRACHOMA.

FROM the ancient capital, Zagreb, we have received a special number of the journal of the Medical Society of Croatia and Slavonia, celebrating the jubilee of its foundation in 1874, and claiming by implication for the new State of Jugoslavia its due place in the scientific and medical world of the West. The title alone of the journal (*Lijecnicki Vjesnik*) is unintelligible to those without the language, for the articles, of which there are 16, are in either German, English, or French. They include clinical studies of diabetes insipidus, a description of a case of thrombosis of the lateral sinus after peritonsillar abscess, notes on the intermediary zone in the spinal cord of mammals in relation to the visceral nervous system, and a discussion of the statistics of eclampsia. The restoration of the ala nasi is the subject of a sound note, and a case of mixed spring catarrh and trachoma with nodules in the parenchyma of the cornea demonstrable by the slit lamp is described. By direct light, on magnification about 55, these nodules were seen as greyish bodies "of poppy corn size," but they were seen better by reflected light as very fine black dots. They ultimately cleared up after treatment with copper, leaving the vision nearly normal. The author, Dr. V. Derkac, claims that this particular change has never been previously described in connexion with trachoma.

ANTITOXIN INTRAPERITONEALLY INJECTED.

Dr. John A. Toomey, Dr. Otto L. Goehle, and Dr. Carl C. Dauer, of the Division of Contagious Diseases, Cleveland City Hospital and the Department of Pediatrics, Western Reserve University, record their observations[1] on 168 cases of diphtheria treated by intraperitoneal injections of antitoxin with comparative observations on 100 other cases of diphtheria, 50 of which received antitoxin intravenously and 50 by the intramuscular route. The only previous series of diphtheria patients on record treated by intraperitoneal injection of antitoxin consist of 12 cases reported by Dr. E. S. Platou, of New York, to whose paper we drew attention at the time.[2] Like this observer, the present writers found the intraperitoneal method was a safe and simple one, and further simplified it by using commercial antitoxin without the addition of saline solution. The injection was received well in all cases. Only one patient with no history of protein sensitivity had a violent reaction which began five minutes after injection and lasted ten minutes. In five other patients menstruation started again, but no other undesirable effects were noticed. The clinical evidence pointed to rapid absorption of the antitoxin by the peritoneum. The membrane disappeared almost as quickly after intraperitoneal injection as when the intravenous method had been used, without the disagreeable reactions associated with intravenous injection. While not recommending intraperitoneal injection for all cases of diphtheria, the writers regard it as the method of choice in cases of toxic myocarditis where it is desirable to avoid the shock accompanying intravenous injection, and also advise its employment in infants and children with poorly developed veins who have had diphtheria for more than two days.

[1] American Journal of Diseases of Children, February, 1925.

WELFARE WORK IN THE UKRAINE.

UNDER the heading the Care of Mother and Child in the Ukraine, with especial reference to the City of Kharkov, the *Brazil Medico* for Nov. 29th, 1924, publishes an article of considerable interest by Herr Friedel Haustein, of Berlin. The author states that on a tour of investigation through Russia, undertaken on behalf of the Section of Hygiene of the League of Nations, he was very favourably impressed by the excellence of the arrangements made for the welfare of mother and child, as also by the satisfactory physical condition of the children, both those in institutions and those outside. A detailed description is given of the system at work in the Ukraine with its antenatal clinics, infant welfare centres, creches, arrangements for the treatment of crippled children, those suffering from tuberculosis and venereal disease, and for the general hygienic supervision of school-children up to the age of 16. As the means at the disposal of the State are very limited, all superfluities are dispensed with and the greatest simplicity is observed in the institutions engaged on the work; at the same time, states the author, mean economies are avoided and the just requirements of hygiene are uniformly met. Special mention, says Dr. Haustein further, should be made of the altruistic devotion and enthusiasm for the work exhibited by all the medical men engaged in it. This continually impresses the observer and explains how it has been possible throughout the Ukraine to build up from nothing and with the scantiest means the equipment necessary for the carrying out on a grandiose scale of the present Government scheme for the protection of mother and child.

ADENOMYOMA OF THE STOMACH.

SMALL pieces of pancreatic tissue are not very uncommonly found in irregular places detached from the main gland altogether. They are usually situated in the wall of the stomach, duodenum, or jejunum, and may rarely form the starting points of carcinomata; generally they remain quite small and are of no evident practical importance. A group may, however, be differentiated which are larger, more complex in structure, and associated with symptoms which make it possible that the surgeon may come across them; their recognition, then, is desirable, since they are in no sense malignant and are satisfactorily treated by local removal without anything drastic in the way of gastrectomy. The current number of the *Journal of Pathology and Bacteriology* (vol. xxviii., p. 195) contains a well-illustrated account by Prof. M. J.

[2] THE LANCET, 1923, ii., 994.

Stewart and Dr. A. L. Taylor, of Leeds, of five cases which they have met with, one at post-mortem, the others at operations. Where clinical details were available, there was a history of intermittent dyspepsia over periods varying from two to 16 years; pain of the hunger type and nausea were present, but no vomiting or hæmatemesis. Removal of the nodule cured the symptoms. These adenomyomata occur as thickened plaques in the stomach wall in the neighbourhood of the pylorus, about half to one inch in diameter, covered with normal mucosa; section shows a localised hypertrophic thickening of the muscular coat with a whorled arrangement; one or more small cysts are also often present. Microscopically, undifferentiated epithelium occurs in acini or ducts which more or less resemble bile or pancreatic ducts, while fully differentiated Brunner-type glands on the one hand and pancreatic acini on the other are also found. Mingled with these epithelial elements, and often forming definite sheaths to the glandular masses, is overgrown smooth muscle which evidently forms an integral part of the abnormality. The condition has no relation to ulcer or carcinoma, and is one of those heterotopias which, as Dr. G. W. Nicholson has shown so well in recent volumes of the Guy's Hospital Reports, throw such interesting light on the problems of growth and differentiation.

TUBERCULIN TESTS IN CATTLE: THE INTRADERMAL TEST.

THERE is issued this week a report[1] of the Tuberculin Committee of the Medical Research Council dealing with tuberculin tests in cattle and having special reference to the intradermal test. The Tuberculin Committee was appointed five years ago to direct investigations into the use of tuberculin in the diagnosis and treatment of human tuberculosis, at which stage the medical members of the Committee shared the general opinion that tuberculin tests, and in particular the subcutaneous tests, were of proved utility for the diagnosis of tuberculosis in cattle, however limited their value might be in the human subject. Shortly afterwards representations were made to the Ministry of Health by Lord Astor, Lord Elveden, and Mr. Wilfred Buckley, showing that the tuberculin tests made in herds producing "certified milk" gave anomalous results, and, as many other stock owners have found the same, the Ministry of Health sought the assistance of the Medical Research Council, within whose province further investigations obviously lay. The problems which the Committee had before them on commencing these investigations were to account for discrepancies in reaction to the subcutaneous test, to ascertain the comparative values of the tests—whether subcutaneous, intradermal, or ophthalmic—and to suggest the most efficient varieties of tuberculin and improvements in the methods of standardisation.

The Committee, of which Captain S. R. Douglas is the chairman and Dr. Salusbury MacNalty is the secretary, came to the following conclusions, among others:—

(1) That the subcutaneous test is perfectly satisfactory for the presence of tuberculosis in cattle, when carried out under the laboratory conditions of a scientific trial, though it may be unsatisfactory in ordinary farm conditions.

(2) That the intradermal test is superior to subcutaneous tests, the ophthalmic test being regarded as subsidiary.

(3) Of the intradermal test it is stated that it is an accurate test for the presence of tuberculosis in cattle, the percentage of error being extremely small, while (4) its further advantages over the subcutaneous test are, no need for temperature observations, no need to rest the animal, or interfere with the ordinary routine treatment; three observations only are usually necessary; and a smaller quantity of tuberculin is needed.

(5) The variety of tuberculin employed is "Old Tuberculin," and it appears to be immaterial whether a bovine or human strain is used; but (6) it should be of proved high potency, being administered undiluted for both intradermal and ophthalmic tests.

Prof. G. Dreyer and Mr. R. L. Vollum, working for the Tuberculin Committee, published in THE LANCET last November[2] a paper on the Precipitin Method for the Standardisation of Old Tuberculin, an abstract of which is given in the report. While the Committee conclude that extremely accurate standardisation may later be found unnecessary, they hold that no tuberculin should be employed in the examination of cattle that has not been tested by some method to show that it is of high potency.

[1] Special Report Series, No. 94. H.M. Stationery Office. Pp. 196. 3s.

THE OPHTHALMOLOGICAL SOCIETIES' CONVENTION.

THE Ophthalmological Society of the United Kingdom, together with its affiliated societies, has decided to hold in London, from July 14th to 17th, a Convention of English-speaking ophthalmological societies and associations, all members of which are invited to attend, and the presidents of such bodies in the different parts of the British Empire and the United States of America have been asked to appoint official delegates. Mr. E. Treacher Collins will preside over the Convention, and an interesting programme has been arranged. Four mornings, two afternoons, and one evening will be devoted to the scientific work of the Convention. On Wednesday evening, July 15th, there will be a symposium on the subject of the Evolution of Binocular Vision by the following selected speakers: Sir Charles Sherrington, P.R.S., Sir Arthur Keith, F.R.S., Sir Frederick Mott, F.R.S., Prof. Elliot Smith, F.R.S., and Prof. S. E. Whitnall. The Bowman Lecture will be delivered by Sir John Parsons, F.R.S., on the afternoon of Thursday, July 16th. Microscopy of the Living Eye has been chosen as a subject for discussion. It will be opened by Dr. Gordon Byers, Montreal; Dr. Arthur J. Bedell, Albany, U.S.A.; Mr. Harrison Butler, and Mr. Basil Graves. Those wishing to take part in it, to read any paper, or exhibit any specimen at the Convention should send in their names to the secretary of the Scientific Business Committee, Mr. R. Foster Moore, 91, Harley-street, London, W. 1, not later than four weeks before the meeting. At a general meeting of the Convention the re-establishment of international ophthalmological congresses on the pre-war basis will be considered. There will be a museum of drawings, instruments, pathological and anatomical specimens, to which all members of the Convention are invited to send exhibits. The General Secretary of the Convention is Mr. C. B. Goulden, 79, Portland-place, London, W. 1, from whom further particulars may be obtained.

[2] THE LANCET, 1924, ii., 1003.

ROYAL NORTHERN (GROUP OF) HOSPITALS.—The annual report of this group, which includes the Royal Chest Hospital and the Hospital of Recovery at Southgate, together with the Convalescent Home at Clacton-on-Sea, shows that during 1924 32 closed beds were reopened, though 28 still remain closed. The number of in-patients treated was 4801 and out-patients 40,834, an increase in both departments on the previous year. The financial report is very satisfactory; donations amounted to £30,847, as compared with £24,975 in the previous year, and legacies to £7950, as against £2634 in 1923. The total income for maintenance purposes was £82,720, as compared with £73,951 in the previous year. The report states that the number of patients attending the light treatment department has so increased that it has been necessary to extend it, and that a new maternity department will be worked in conjunction with the Maternity Nursing Association, while arrangements are being made for the interchange of nurses and pupils for training in midwifery. In the venereal diseases department an additional session for women and children was arranged. During the year 848 new cases of venereal disease were treated, and the total number of attendances was 14 697.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXVIII.—THE TREATMENT OF SYMPTOMLESS HÆMATURIA.

UNDER this term is included a group of cases characterised by the presence of hæmaturia as the only symptom or sign of which the patient complains—pain, frequency of micturition, pyuria, and other symptoms so frequently associated with bladder or kidney troubles being here conspicuously absent. Pain, however, may occur in symptomless hæmaturia if the bleeding be profuse enough for clots to form and to pass along the ureter or urethra, but such pain is merely an accident in the case, and is not dependent upon the actual cause of the hæmaturia. The hæmaturia is usually simply a chance discovery on the part of the patient, who happens to notice the altered colour of the urine.

Hæmaturia of this symptomless type may arise from a great diversity of pathological conditions—in fact almost any disease of the urinary tract may occasionally so first declare itself, though with most of such it is very exceptional. In 1922 I analysed 100 cases that had come under my own observation to ascertain the pathological conditions ultimately disclosed. The hæmaturia was of vesical origin in 65 (the commonest single cause being villous papilloma, 41 cases) and of renal origin in 35 (malignant growths, including hypernephroma, being the most frequent cause). In 86 cases the pathological cause was definitely ascertained, and of these 71—i.e., 82·5 per cent.—were due to neoplasm (44 benign and 27 malignant). Thus of all my cases of symptomless hæmaturia of known ætiology benign neoplasm accounted for 51·1 per cent. and malignant neoplasm for 31·3 per cent. This great preponderance of new growths will naturally lead the surgeon to think first, in any given case, of neoplasm, and especially of villous papilloma of the bladder; the fact, however, that in about one-third of all cases a malignant growth is present, possibly in an early and operable stage, should emphasise the extreme importance of tracing the hæmaturia to its source at the earliest opportunity. In my series, among the rarer causes of vesical origin were included prostatic enlargement, simple "solitary" ulcer, and calculus fixed in a post-prostatic pouch; of renal origin papilloma of the renal pelvis, angeioma of a renal papilla, renal calculus, congenital cystic disease, chronic nephritis, mobile kidney, and "essential" hæmaturia. This term is applied to renal hæmaturia, the ætiology of which cannot be determined even after the application of all the methods of urological investigation at present known. It is an astonishing, and at the same time a disconcerting fact that, as in two of my cases, a kidney may bleed so profusely as to necessitate nephrectomy to prevent immediate death from hæmorrhage, and yet subsequent examination by an expert pathologist may fail to discover any macroscopic or microscopic change in it.

Investigation of a Case.

The first step in the clinical investigation of a case of symptomless hæmaturia is to make sure, by microscopic detection of blood corpuscles, that it is really hæmaturia, and not the rare condition of hæmoglobinuria. Further, general diseases that cause hæmaturia such as scurvy-rickets, hæmophilia, the group of anæmias, and the passive congestion of heart disease, must be excluded. Next must be investigated, in order of urgency, (1) the source of the bleeding, whether vesical or renal, and if the latter whether unilateral or bilateral, (2) the nature of the lesion causing it, and (3) the functional state of the rest of the urinary tract. The physical characters of the blood—whether intimately mixed or not with the urine, whether bright red or darker in colour, and whether associated with clots of any characteristic shape—although serving as a rough-and-ready guide to the source of the hæmorrhage, are not sufficiently trustworthy in any given case. By cystoscopy alone can the source of the hæmorrhage be determined with certainty, and its application, particularly if bleeding is actually in occurrence, should be regarded as a matter of extreme urgency. If the hæmaturia be of renal origin, it is only at this time that it can be traced to the defaulting kidney; it may last but a few hours, and may not recur for many months, during which, in about one-third of all cases, a malignant growth will be steadily progressing, and its chance of successful removal becoming lost. It still happens much too often that the practitioner's first efforts are directed not to the ascertainment of the source of the bleeding but to its immediate arrest; he puts the patient to bed and administers morphine and internal styptics. Although this may allay the alarm which many patients feel, in the long run it will prove the greatest possible disservice: it is far better to let the hæmorrhage continue until arrangements can be made for a cystoscopic examination to trace it to its source.

The Need for Cystoscopy.

Cystoscopy is as urgently called for in this type of case as is early laparotomy in acute abdominal crises. Cystoscopy during bleeding will, if this be of renal origin, show from which ureteric orifice the blood is escaping; if the bleeding is of vesical origin and not too profuse completely to prevent vision, both the source of the hæmorrhage and the causative lesion will be seen. If it be very profuse, repeatedly washing out the bladder with hot boric lotion, combined with the introduction of a solution of adrenalin, will usually suffice, but if these measures fail to secure satisfactory vision, then this fact alone is strong presumptive evidence of a vesical origin, and is sufficient justification, should the hæmorrhage be alarming, for immediate suprapubic cystotomy. Cystoscopy, after cessation of the hæmorrhage, may fail to show its source. Should it have been of vesical origin some lesion in the bladder sufficient to account for the hæmorrhage will be noted; the absence of such lesion indicates a renal source, though it does not indicate which kidney is at fault. If one ureteric orifice has a definitely abnormal appearance, this suggests, though it does not prove, that the corresponding kidney is the offender; no proof is, in fact, possible, save actually seeing the bleeding in progress, and this should emphasise the importance of not permitting the bleeding stage to pass without a cystoscopic examination. Thus in one case cystoscopy, after hæmorrhage had ceased, showed a large villous papilloma of the bladder, which might well have been a sufficient cause; later cystoscopy, however, during bleeding, showed blood coming from the left ureteric orifice, and renal exploration disclosed a hypernephroma. In another case, one of right renal calculus shown by previous radiography, was admitted urgently into the Manchester Royal Infirmary with severe right renal colic and profuse hæmaturia. The latter was thought, not unnaturally, to be due to the calculus; routine cystoscopy, however, traced the blood to the left ureteric orifice, and later exploration of the left kidney again disclosed a hypernephroma. If the bladder be normal and no renal tumour or other physical sign be discovered, then there is nothing for it but to wait until the hæmaturia recurs and cystoscope during the attack.

Bleeding from the Kidney.

When the blood has been seen to escape from one ureteric orifice, a thorough investigation must be instituted by all the usual urological methods to ascertain, if possible, the pathological lesion in the corresponding kidney—careful palpation of the loin, a chemical, microscopic, and bacteriological examination of the urine, and possibly also of the separated urines after ureteral catheterisation, radiography, and pyelography. By these means positive evidence may be obtained of certain conditions—e.g., calculus, tumour, or tuberculosis—but if they yield negative evidence

only an exploratory nephrotomy should always be performed. Only when this has been undertaken with negative result do I care to regard the hæmorrhage as "essential." American writers apply the label "essential" when urological investigation short of exploratory nephrotomy fails to show a cause, and advocate expectant treatment of "essential" hæmaturia—intrapelvic injection of silver-nitrate solution through the ureteral catheter, the administration of calcium salts by mouth or intravenously, the subcutaneous injection of horse-serum, &c. I would fear in these cases that an early malignant growth was possibly being overlooked. This would certainly have happened in the two earliest malignant renal growths I have operated upon, which were discovered only after operative exposure, and the patients are both well four and a half and two years respectively after nephrectomy.

Before undertaking operative exposure of the kidney it is necessary, inasmuch as it may disclose some pathological condition requiring nephrectomy, that the functional capacity of the opposite kidney be estimated. For this I rely most upon the indigo-carmine test, the dye being injected intravenously, when the appearance of a deep-blue efflux at the ureteric orifice within three to six minutes is a safe indication of good renal function. Where the opposite kidney is efficient the bleeding organ is exposed from the loin, the upper end of the ureter and the pelvis carefully examined by palpation from without, the renal pedicle temporarily compressed with a light clamp, and the renal parenchyma freely incised a little posterior to its coronal plane until the pelvis and calyces are widely opened. If no macroscopic lesion be found, a small slice of the parenchyma is removed for microscopical examination, and the kidney carefully sutured with deep and superficial catgut sutures. The case must now be classed as one of "essential" hæmaturia, and should the hæmorrhage recur it may be treated expectantly with the confidence that a malignant growth has not been missed; only should the hæmorrhage become so profuse as immediately to threaten life should further operative treatment—i.e., nephrectomy—be considered.

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The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdrs. to be Surg. Comdrs.: H. B. Parker and J. L. Priston.

TERRITORIAL ARMY.

Capt. G. F. R. Smith to be Maj.

Capt. C. W. Healey (late Gen. List T.A.) to be Lt., and relinquishes the rank of Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Maj. P. R. Bolus, from Active List, to be Maj.

ROYAL AIR FORCE.

D. B. Smith is granted a short service commission as Flying Officer for three years on the Active List.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 4TH, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 152; scarlet fever, 1713; diphtheria, 864; enteric fever, 42; pneumonia, 1449; puerperal fever, 54; cerebro-spinal fever, 8; acute poliomyelitis, 7; encephalitis lethargica, 56; dysentery, 10; ophthalmia neonatorum, 111. There were no cases of cholera, plague, or typhus fever notified during the week. The number of small-pox cases showed an increase of 18 over the number for the preceding week.

Deaths.—In the aggregate of great towns, including London, there were 5 deaths from enteric fever, 125 from measles, 11 from scarlet fever, 117 from whooping-cough, 29 from diphtheria, and 242 from influenza, as compared with 281, 304, 283, and 361 in the four preceding weeks. In London itself the deaths from influenza numbered 38, from whooping-cough 32, and from diphtheria 7.

Special Articles.

THE GOLD TREATMENT OF TUBERCULOSIS.

PRELIMINARY REPORT BY THE MEDICAL RESEARCH COUNCIL.

I.

VARIOUS gold compounds have from time to time been used in the treatment of tuberculosis. Recently a soluble complex salt of gold and sodium—namely, sodium aurithiosulphate—which has long been known to chemists, and is now made available under the trade mark of "Sanocrysin," has been introduced to therapeutics as a treatment for tuberculosis by Prof. Möllgaard of Copenhagen, who has found that it has the advantage of dissociation into complex-ions so that toxicity due to free gold-ions is avoided. Such toxic effects as this compound produces in tuberculous but not in normal subjects are attributed to destruction of the bacilli and increased liberation of tubercle toxins; and Prof. Möllgaard has also prepared an antitoxic serum for use, when necessary, to counteract these ill-effects. The results of experiments on animals and of numerous trials on human patients in some Danish hospitals have been fully described in his book, autumn 1924, on the "Chemotherapy of Tuberculosis." Critical summaries of these results and of other work in Denmark have been published recently in *The Lancet* and in the *British Medical Journal*. Clinical trials are now proceeding also in Germany and in Canada.

Prof. Möllgaard very courteously gave to the Medical Research Council a full supply both of the gold salt and of the protective serum for clinical trial in England, but desired that the preparations should not be made available for general use in medicine until the results of these trials were completed. In December he and his chief clinical colleague, Dr. Secker, visited England and gave a personal communication on the subject to those who were asked to try the preparations; while Dr. Secker remained in London long enough to visit several hospitals, advise on the selection of cases, and give the observers invaluable help during the treatment of individual patients by instruction drawn from his own wide experience.

The preparations were issued by the Council, as on the similar occasion of the introduction of insulin to therapeutics, only to those who were not engaged in private practice—that is, to whole-time professors of medicine or to tuberculosis officers. The Ministry of Health were kept in close touch with the work through a liaison officer. On account of the general interest aroused by discussion of this method of treatment, the Council think it desirable to issue this preliminary report on the early results of cases so far treated in Great Britain, and to explain their further policy.

Work in England has been in progress for less than three months; it has not been on a large scale, but the value of the opinions formed has been enhanced by the arrangement which used several observers of small groups working at first independently of each other rather than one observer of a large group. It was evident, when the observers subsequently met in the first conference upon which this report is based, that there was so great a divergence of opinion upon the value of the drug that any single observer relying solely on his own experience might easily have been led to a summary opinion that would have been unduly emphatic in his judgment for or against the treatment. The report deals solely with clinical results, and does not consider the laboratory evidence for the effect of the gold salt on tubercle bacilli or infected tissues nor that for the protective action of the specific serum.

Each dose of sanocrysin was dissolved in 10 c.cm. of distilled water and injected intravenously. The usual amount was 0·5 g. for the first injection and then repeated injections of 1 g. each at intervals of about three days, unless a severe reaction on the part of the patient occurred and compelled delay until the reaction had subsided. The total amount used in any case was generally about 5 or 6 g., and the injections were rarely continued until the goal suggested by the Danish experiences was attained—namely, a final state in which the last injection produced no rise of temperature.

The specific serum, usually from horses immunised by diaplyte tubercle vaccine, though at first a weaker calf serum also received trial, was injected into the muscles in doses of 20 c.cm. Its action is supposed to be that of neutralising the flood of tuberculous toxins liberated by the action of the gold salt on the infected tissues, and thus of lessening the general severity of the reaction to the chemotherapeutic injection. In cases with heavy tuberculous infection the serum was used either before or together with the first gold injection as a preliminary measure. In mild cases it was not used until a reaction of some severity had occurred; and in many instances it was never used at all.

Effects of the Injection of Sanocrysin.

Vomiting was often noticed as an immediate effect within a few minutes of the injection. In one control patient, without evidence of tuberculous disease, there was nausea and prolonged anorexia after three injections but no temperature rise or any other reaction. There were no other control observations of cases with fever from known causes other than tuberculosis, so that the evidence is not sufficient to ascertain whether the gold salt can be used as a test to distinguish non-tuberculous from tuberculous febrile states. In a group of five cases of pulmonary tuberculosis, that were clinically mild but radiologically moderately extensive, there were slight pyrexia and trifling albuminuria, but no other features of reaction. The gold salt in amounts up to 5 or 6 g. therefore seemed to be non-toxic for patients with only slight tuberculous lesions.

Severe reactions were generally produced in cases of more extensive infection. The temperature rose within a few hours to 103° or 104° F.; but there was no case of hyperpyrexia nor of critical fall. Vomiting often recurred, but diarrhœa was not often observed. The patient felt ill, depressed, and lost appetite. A metallic taste was sometimes complained of, and there was a tendency to ulceration of the mouth and throat. The rise of temperature lasted three or four days, but was generally less with each successive dose. After the second or third dose rashes often appeared, like those of measles or scarlet fever, and not often itching. In one case an erythematous rash persisted for a fortnight and was accompanied by an outbreak of many indolent open sores. The rashes were seen in cases where no serum had been given. They were perhaps more frequent in cases of closed tuberculous infection.

Albuminuria was a common occurrence, and in some cases exceeded 1 per cent., though it did not last long. No œdema resulted and there was no evidence of persistent renal lesions. Measurements of blood-urea were not made in any of the cases of severe albuminuria. In one necropsy, where there had never been more than trifling albuminuria, 8 per cent. of the total metallic gold injected was found in the kidneys on death 28 days after the last injection of sanocrysin. Gold was proved to be excreted by the bowels and by the kidneys after an injection of sanocrysin. Jaundice of a grave nature, which in the Danish experience was a very rare event, occurred in another patient who died, and a relatively large amount of gold was found on analysis of the liver.

Features strongly suggesting that the gold salt had a direct action at the site of the tuberculous infection were often seen. Thus, in the lungs a focal reaction was evidenced by local pain, a sense of tightness, and by prolonged tachypnœa. This was in at least three instances aggravated by the development of a very critical state in which the pulse became rapid and feeble and the patient so collapsed, though the temperature did not fall seriously, that great anxiety was aroused as to the chances of recovery. Except for a local increase of crepitant râles, there were no clear changes in the physical signs in the lungs during these focal reactions. Cough, however, was generally increased and sputum was at first more abundant if the patient had strength for expectoration. Subsequently both cough and sputum tended to lessen.

Headache was never intense. A general state of depression and lack of vitality together with loss of weight tended to develop in cases of extensive infection after a course of treatment, and this retarded subsequent recovery in the hospital wards.

Effects of the Injection of the Protective Serum.

Clinical experience varied on this point. At some hospitals nearly every patient had severe serum sickness, perhaps with its own rash and vomiting, and certainly with severe joint and muscle pains. Other observers never saw such effects. The differences were not explained by reference to any particular batch of serum, or to different effect of calf or of horse serum respectively. There were, however, no examples of dangerous anaphylactic phenomena.

It was difficult to form a clear conclusion as to the benefit of the serum. Some observers thought they had proof of its power to control albuminuria and focal reactions in the lungs, if given early and before these features became serious; others were not convinced. In general, serum was freely used for severe cases of infection. A few trials were made of the influence of the serum on the general state of a tuberculous patient apart from the use of sanocrysin, but they led to no demonstrable results.

Summary of Clinical Results.

Clinical experience in Britain has confirmed the description in Prof. Möllgaard's book of the immediate effects of sanocrysin as seen in Danish hospitals. The drug does appear clinically to have a specific action on tissues infected by tubercle bacilli, and the severity of the constitutional reactions does appear to be directly related to the intensity of the tuberculous infection. Further, the drug seems to have but slight toxicity for human patients who are not infected by tuberculosis, though in this respect very few control observations have been made. On account of the severity of the reactions in the first tuberculous patients chosen for treatment, no observer at the beginning felt justified in deliberately making control observations in other febrile infections. For the same reason no one cared to begin straight away with the treatment on a large number of tuberculous cases, but each observer preferred to select three or four individual patients and proceed cautiously.

The total number of cases covered by this preliminary report is small, about 30, of whom 22 definitely had tuberculous infections of the lungs. Two of the pulmonary cases died, death in one hopeless case being perhaps accelerated by the treatment, and occurring in the other unexpectedly as the result of toxic jaundice. The remaining 20 do not lend themselves to any numerical analysis. Uncomplicated pulmonary tuberculosis is a disease of which few physicians can confidently foretell the progress, upward or downward, during any given period of two or three months, which was all the time available for these preliminary observations. But it was the opinion of those observers who had had most experience in dealing with consumption that the early cases of open tuberculous infection of the lungs did show some evident improvement, though there was no dramatic benefit, such as that seen with insulin or salvarsan in their corresponding diseases. On the other hand, cases with more advanced disease did not stand the treatment well,

and the condition of some of these has been made worse. The latter experience accords with that of Dr. Secker of Copenhagen. Serious cases of long standing cannot endure the treatment in its present form.

There were two cases, not included in the preceding 20, in which most striking improvement followed at once upon the use of the drug, both the patients having lain three months in hospital previously without making any advance. One appeared to be a case of closed tuberculosis of the lung, spreading out from hilum glands, though it could not be proved that the pulmonary inflammation was caused by tubercle bacilli and not by some other smouldering infection. The other was a case of tuberculous peritonitis with an encysted collection of fluid that vanished at once upon treatment. In each instance the patient showed the rash and rise of temperature that in other proved cases of tuberculosis have followed the injection of sanocrysin. No case of pleural effusion was treated in this preliminary group because the results in this condition would not have offered any decisive evidence. Lupus of the skin, spinal caries, renal tuberculosis, and tuberculous glands are now being treated; but their progress is not sufficiently advanced to be included in this report.

The evidence, therefore, despite the relatively poor results in open pulmonary tuberculosis, and that is unhappily the commonest form of tuberculosis, is sufficiently encouraging to demand further clinical study. This is particularly so in view of the one experience common to all observers—namely, that the drug seems to exert a specific action on tuberculous tissues. The Medical Research Council expect that many months will pass after the issue of this preliminary report before any further definite conclusions can be drawn. Trial on a larger scale is now justified, and it is hoped to widen the field of work with the help of more observers. But the Council are of opinion that such further trial and extended observations are imperatively required before it can be clearly stated that this gold salt is of value in the treatment of tuberculosis and before it should be made available for general use in medical practice in Great Britain.

II. CLINICAL OBSERVATIONS.

The following section briefly resumes the clinical observations at the several places where the treatment was used. In every patient radiograms of the chest were taken before, during, and after treatment.

St. Bartholomew's Hospital (Prof. F. R. Fraser).—One case, 30 years old, general pulmonary tuberculosis; T.B. found once. Total gold salt used, 5·25 g. Severe reaction at first, but final injection of 1 g. caused no rise of temperature. No definite change.

London Hospital (Prof. A. W. M. Ellis).—Five cases of pulmonary tuberculosis, one case of tuberculous meningitis, and one non-tuberculous control. The general impression of the results was definitely unfavourable.

CASE 1.—Aged 17. Four years' history extensive pulmonary tuberculosis both lungs. General condition good; had gained 1 st. in weight. Tubercle bacilli found once during treatment. Total gold salt used 6·5 g. in eight weeks. Severe reactions, fever, rash, ophthalmic reactions, albuminuria, loss of weight. Gradual recovery on stopping treatment to conditions very much as on admission. No change in physical signs. Result: No change.

CASE 2.—Aged 53. Three months' history of pleural effusion and fibrosis. General condition fair. Tubercle bacilli present on one occasion only. Total gold salt used 2·75 g. Gold salt discontinued because of prostration, albuminuria, prolonged nausea, and anorexia. Severe serum sickness. Lost weight and has not regained it two months after cessation of treatment. Result: No improvement, apparently made worse by treatment.

CASE 3.—Aged 23. Two years' history. Extensive pulmonary tuberculosis both lungs. General condition good; had recently gained 1 st. in weight. Tubercle bacilli disappeared from the sputum during treatment but reappeared later in large numbers. Total gold salt used 1·5 g. Gold salt discontinued because of vomiting and continuous hiccough. Prolonged anorexia. Fever, rash, and albuminuria. Three weeks after last injection onset of hectic temperature with physical signs indicating rapid and extensive spread in the area of pulmonary involvement. No subsequent improvement. Is going steadily downhill. Result: Treatment led to extensive spread of the disease and marked general deterioration.

CASE 4.—Aged 36. Three years' history. Extensive chronic tuberculosis both lungs. General condition excellent, afebrile; albuminuria. Renal function normal. Tubercle bacilli absent. Total gold salt used 5·5 g. Moderately severe febrile reactions, nausea, and vomiting. Ten days after the last injection temperature became hectic and has remained so with marked increase in physical signs and evidence of rapid spread of the infection. At the same time there appeared a very severe exfoliative dermatitis apparently identical with that seen in severe arsenical poisoning. Result: Extensive spread of the disease. Severe exfoliative dermatitis.

CASE 5.—Aged 19. Three years' history. Extensive chronic pulmonary tuberculosis of left lung, early involvement of right. General condition excellent, afebrile. Tubercle bacilli disappeared during early part of treatment but reappeared later in increasing numbers. Total gold salt used 7·5 g. Treatment followed by severe and prolonged reactions with fever, rash, albuminuria, and breathlessness. Severe serum sickness. After the third injection the temperature never again reached normal, the physical signs in the chest increased both in quantity and in extent, and tubercle bacilli reappeared in the sputum. Subsequent injections failed to influence the course of the disease. Serum, when given, resulted in violent reactions with rigors and collapse. The resulting situation was a very difficult one. It was obvious that the patient was going steadily downhill. It was decided to try and increase the concentration of the drug even though, on account of the reactions, serum could not be given. Two injections of 1·0 g. were therefore given with one day intervening. Four hours after the second injection there were dyspnœa, cyanosis, and blood-stained frothy sputum. Death occurred in two hours. There was no post-mortem examination. Result: Death.

CASE 6.—Aged 9 months. Tuberculous meningitis. Total gold salt used 0·4 g. in two days. No evidence of any effect was seen. Death occurred on third day. Result: No influence detected.

CASE 7. *Control.*—In addition a case of lymphadenoma or Hodgkin's disease was treated as a control. The patient received three injections of the gold salt and no serum. There was no rise of temperature, no albuminuria, and no rash, but nausea and prolonged anorexia resulted.

St. Mary's Hospital (Prof. F. Langmead).—Three cases of pulmonary tuberculosis. The early results were unfavourable and one patient died, apparently in consequence of the treatment.

CASE 8.—Aged 18. General condition good, but T.B. abundant. Total gold salt 1·5 g. in four days and over 200 c.cm. serum. Vomiting, diarrhœa, rash, fever, albuminuria, and definite serum reaction. Focal reaction in lungs. On tenth day after the last injection of gold salt jaundice appeared and rapidly deepened. The patient died with hæmorrhage from the bowels 29 days after the last injection. Necropsy found spreading tuberculosis in the lungs and recent tuberculous ulceration of the bowels. There was only one hypertrophied kidney and that showed tubular nephritis. The kidney was not analysed for gold, but in the liver was found 0·028 g. of gold—i.e., 4·75 per cent. of the total metal injected.

CASE 9.—Aged 32. Early disease of right apex, afebrile. T.B. present. Total gold salt 5 g. Fever, rash, loss of weight, albuminuria; general condition deteriorated, but is now improving and temperature is again normal. Physical signs unchanged and T.B. still present in sputum.

CASE 10.—Aged 29. Peribronchial fibrosis and doubtful physical signs, but T.B. present; temperature normal. Total gold salt 6 g. Fever, severe serum sickness, loss of weight, slight albuminuria, pain in chest, and increased expectoration. General condition at first worse but later improving. No T.B. in sputum in last three weekly examinations, but patient developed pleurisy seven weeks after treatment was ended.

St. Thomas's Hospital (Prof. H. MacLean).—Only early or slight pulmonary tuberculosis was treated, in five cases of which four had T.B. present. They were in fairly good general health, with few symptoms and generally very little pyrexia. Gold salt was given in doses of 1 g. at four to seven days' interval up to a total of 4 or 5 g. No serum was used. The reactions were slight, a little pyrexia, some albuminuria, and increase of cough. No focal pain in the chest, no anorexia. All the five cases have subsequently

improved, but it is difficult to decide whether this improvement is more than would have been effected by ordinary hospital treatment. This group is, however, of great importance as a control to show that the gold salt exerts little obvious effect on the general health of patients with only mild tuberculous infections.

CASE 11.—Aged 27. Three months' history. No T.B. 4·5 g. given. No reactions except slight albuminuria persisting since fourth dose. General condition improved. X ray: Disappearance of triangular opacity in right axilla which had suggested tuberculous infiltration.

CASE 12.—Aged 21. Six months' history. T.B. present. X ray: Lisease upper third both lungs. Very dense R. apex, moderately dens: L. Some fibrotic contraction R. apex. Had begun to improve already with hospital treatment. 4·25 g. given. Slight temperature reactions. Transient albuminuria for five days after fourth dose. Result: Previous rate of improvement maintained or accelerated. Final radiogram shows no change except increased contraction R. apex, though radiogram taken during reaction showed increase of shadows. T.B. present on discharge but some evidence of fragmentation

CASE 13.—Aged 28. Three months' history T.B. present. X ray changes of medium density both lungs, occupying one-third of pulmonary fields. 5·25 g. given. No definite reactions. Irregular pyrexia persisted. Attack of pleurisy after four weeks. Result: General condition improved. X ray: No change.

CASE 14.—Aged 18. Short history. T.B. present. X ray: Medium opacity upper half both lungs. General condition good. 5·25 g. given. No marked reactions. Result: General condition improved. Sputum: No T.B. on March 9th, 1925. No sputum since.

CASE 15.—Aged 24. Eighteen months' history. T.B. present. X ray: Very slight changes L. apex. General condition not very good. Two doses, each followed by slight pyrexia. Rash resembling erythema multiforme two days after second injection. Increased slowly during next six days. Began to fade on fifteenth day. Treatment in consequence delayed, and is now being completed.

University College Hospital (Prof. T. R. Elliott).—Four cases, of which two appeared to be cured by the treatment though the evidence was not conclusive. In two pulmonary cases with T.B. in the sputum the results were, on the other hand, definitely unfavourable.

CASE 16.—Aged 18, bi-lateral apical infection with one year's history. Poor condition though afebrile and T.B. always in sputum. Total gold salt, 6·25 g. in 34 days, with 360 c.cm. serum. Much albuminuria, no rash, no severe serum sickness. Marked focal reaction in lungs, with pain, dyspnœa, and twice a serious circulatory collapse. Prolonged vomiting and anorexia. General condition worse and T.B. in sputum more abundant.

CASE 17.—Aged 29, a hopelessly rapid caseous tuberculosis, chiefly of right lung, with less than six months' history. T.B. in sputum. Patient so ill that he seemed unlikely to survive more than a couple of months. Total gold salt, 4 g. in 11 days, with 300 c.cm. serum. Slight albuminuria and no rash. Marked focal reaction in lungs with dyspnœa that persisted. Died four weeks after last gold injection with repeated pulmonary oozings of blood. Necropsy confirmed the radiograms in showing that the caseous changes had spread rapidly into the left lung since treatment began, and the detachment of one large mass of caseous lung tissue loose within a cavity on the right side suggested that some unusually active process of destruction had been taking place. There was no tuberculosis outside of the lungs. Analysis found that of the total metallic gold given (40 per cent. of 4 g. salt—i.e., 1·60 g.), 0·128 g., or 8 per cent., was still present in the kidneys. The percentage of gold to the weight of the kidney was 0·037 per cent. The liver retained a total of 0·012 g.—i.e., barely one-seventieth of the percentage found in the kidney. The lungs contained only traces that could not be measured. This rapid disappearance of the gold from the tissues where its effect was desired suggests that the salt should not be given intensively in severe cases, as advised by the Danish physicians, but at longer-spaced intervals.

CASE 18.—Aged 20, tuberculous peritonitis with large encysted collection of fluid in the lower abdomen. Pleurisy at 14, with present X ray evidence of fibrosis on right side. No T.B. in sputum and abdomen not explored. Condition stationary during three months' rest in hospital previous to treatment. Total gold salt, 4·5 g. in 17 days and 80 c.cm. serum. Febrile reaction, with rash and some pain in right chest and in abdomen. The tumour had vanished by the time that the last dose was given. No recurrence a month later, but still some chronic inflammation found on rectal palpation of the uterine adnexa. Patient gaining weight. Apparently a most definite improvement as the immediate result of treatment.

CASE 19.—Aged 14, query localised tuberculous broncho-pneumonia. Admitted for large quiescent tuberculous glands in neck, which were excised and microscoped. After anæsthetic for this operation patient developed consolidation of left lower lobe, which took four weeks to clear up. X rays subsequently showed much enlargement of hilum glands and a shadow spreading outwards in the middle of the right lower lobe. The patient was under medical treatment in hospital for three months, during which time there were no T.B. in sputum but there was continuous pyrexia and varying loss of weight. Boy seemed seriously ill when gold treatment was begun. Weight 5 st. 7 lb. Total gold, 1·25 g. in six days. Severe and prolonged rash, rise of temperature, and fall of weight to 5 st. 2 lb. No focal reaction in glands of neck. Then recovery, with temperature thenceforward normal and rise of weight by 2 or 3 lb. weekly to 6 st. 5 lb. on discharge from hospital. Still faint X ray evidence of fibrosis in area of earlier opaqueness in right lung. The boy was cured with unusual rapidity of his lung inflammation, which was not actually proved to be tuberculous, though its appearance was clinically identical with that of hilum tuberculosis.

Cardiff (Prof. S. L. Cummins).—Three cases of early pulmonary tuberculosis of which two showed definite improvement and one, whose preliminary course of treatment has only just been completed, feels better although he has not yet started to regain weight.

CASE 20.—Aged 21. Early disease involving two lobes, but only slight in density. Fair general condition. T.B. present. Total gold salt, 4·5 g. in five weeks, 92 c.cm. horse serum. Moderate reactions after first four doses. Sputum ceased. T.B. vanished. Lost 2½ lb. during treatment. Has now regained this and added about 4 lb. to original weight.

CASE 21.—Aged 28. Definite pulmonary disease right apex, with cavitation. T.B. present in great abundance. Total gold salt, 6·5 g. in seven weeks. 95 c.cm. horse serum. Moderate reactions and transient albuminuria after gold salt. Severe reactions after serum. Sputum diminished and T.B. greatly reduced in number. Has lost 9 lb. during treatment. Is now feeling "as he used to before illness," but has not yet started to regain weight.

CASE 22.—Aged 15. Dullness and bronchial breathing upper third right lung. T.B. present in fair numbers. Good general condition. Total gold salt, 3·25 g. in five weeks. 36 c.cm. serum. Reaction and slight albuminuria after first dose. Intense serum sickness. Lost 3 lb. at first. Has now put on 4 lb. Is still under treatment. Appears much improved so far. No T.B. in sputum on last three examinations.

Edinburgh (Prof. Sir Robert Philip and Prof. D. Murray Lyon).—Work at Edinburgh was not commenced until January, and while a much larger series of cases was tried than at any individual centre in London few of these have yet reached the end of treatment. In general the results seem favourable. Serum was sparingly used, and in many cases not at all. In some tuberculous cases the Danish anti-tuberculin serum was used alone without the gold salt, and it was not seen to have any constant influence on the temperature curve. All the patients selected were without exception afebrile at the beginning of the treatment. In the pulmonary cases tubercle bacilli were present at the commencement. The first dose of ½ g. sanocrysin produced either very little reaction or a rise of about 2° F., the whole disturbance as a rule passing off in 24 to 48 hours. In two cases the temperature reaction to the first dose was prolonged for about ten days, a swinging temperature increasing for the first three or four days, reaching to about 103° F. and then gradually disappearing. No albuminuria or rash followed the first dose. The second dose of sanocrysin was usually followed by much larger temperature disturbance lasting a little longer than that of the half dose, but in most cases each subsequent dose gave rise to a smaller temperature response, until in some cases no rise occurred at all.

A large number of the cases complained of loss of appetite and in some the anorexia was very severe; vomiting has been frequent—in some cases within a

few minutes after each dose, in other cases a few hours later; or again, occurring only in the early morning each day. A considerable quantity of albuminuria might appear after the second or third dose and remain present for several days, gradually decreasing in quantity, even without the use of serum. Renal cells and casts were present in some of the cases, but there have been no other signs of renal irritation or nephritis. A case of tuberculous kidney showed no increase in albuminuria under treatment, but after four doses treatment had to be suspended because of recurring vomiting. Skin rashes have appeared in about three-quarters of the cases, irrespective of whether they have had serum or not. The rashes have varied considerably in character, from fleeting erythemas and urticarias to persistent dermatitis. In some cases the whole rash disappeared in a few hours, and in many it lasted for three or four days. The rashes were judged by an observer who had clinical familiarity with those caused by extensive tuberculin treatment to be very similar to the latter. In one pulmonary case a severe reaction has persisted for about three weeks, the whole skin being inflamed, the tissues about the face swollen, and there has been a universal desquamation. Apparently this subject had had some previous skin trouble.

In three pulmonary cases with abundant T.B. and definite X ray changes there was some improvement. Sputum was lessened, but a severe rash occurred in two, and in one of these there was persistent vomiting and anorexia. In eight other cases, including lupus of the face, renal tuberculosis, and scrofulous glands of the neck, no alarming features of reaction have yet been observed.

THE HEALTH OF THE ARMY IN 1922.

THE report on the health of the army for 1922 [1] opens with a letter from the Director-General, Sir W. Leishman, to the Under Secretary of State for War, announcing improvement "in almost every direction" in the health of the army, which has, he adds, continued into 1923. The report for 1923 is already in preparation, for it is hoped that these reports will soon be issued within 12 or 14 months of the close of the period concerned. This is obviously a desirable change, since the sooner the reports appear after the events they summarise, the more useful they are to the officers of the army and the other services. This report is arranged in the same sections as last year.

General Considerations.

The physique of the army generally has improved, though standards are still lower than before the war. The average strength of officers in the regular army was 12,058, of whom 120 per 1000 were treated as out-patients, 298·3 were admitted to hospital (374·2 in 1921), and 4·48, against 5·9 in 1921, died. The chief causes of illness were diseases of the digestive system, other than of the tonsils or of the liver, 44·8 per 1000, and local injuries 44·1 per 1000. No "wounds in action" are mentioned, though three officers died in Ireland from gunshot wounds, classed as local injuries, and no suicide, though one is noted on p. 44. The number of officer invalids is not stated.

The average strength of warrant officers, non-commissioned officers, and men was 208,079. The ratio per 1000 of hospital admissions was 515·8 (650),[2] with deaths stated as 3·22, but really 3·38, when suicides are included (4·20; 4·32 in 1921), and invalids finally discharged were 19·31 (27·48); 31·54 (41·20) were constantly sick. Each rate is thus about 20 per cent. lower in 1922. The diseases causing the most numerous admissions to hospital were malaria 65·0 (99·8), "diseases of the digestive system other than those of the liver or inflammations of tonsils" 47·4 (58·6), gonorrhœa 46·8 (45·9), and local injuries, with 12 deaths in Ireland due to gunshot wounds, 45·0 (53·2). Influenza 29·6 (20·9) has slightly increased, sand-fly fever 18·8 (34·0) is much lower, and enteric fever 1·2 (1·5) is less. The most frequent causes of death were local injuries, 0·56 (0·78), pneumonia, 0·44 (0·52), general injuries, 0·29 (0·56), and "other diseases of the digestive system," 0·27 (as in 1921). Malarial deaths have dropped to 0·16 (0·27), tuberculosis, pulmonary, remains 0·18. The case-mortality of enteric fever was 11·6 per cent. (8·33), of pneumonia 10·57 per cent. (11·7), and of small-pox 27 per cent. (22); of the three reported cases of meningococcus infection two died. Troops on board ship numbered 4157, with admissions to hospital 364·0 (414·6); there were no deaths from pneumonia (0·44 in 1921).

The wives of other ranks, 16,811, were admitted to hospital, 47·9 (50·3) for disorders of the generative system, and "other diseases of the digestive system" came next, 23·7 (33·3). Their death-rate was 3·15 (3·74). They got enteric fever as often as the men, and died equally, but their admission for pneumonia and bronchitis were a quarter of the men's, and their death-rates a half. There were 26,080 children, with a death-rate of 9·59 (12·07), due chiefly to disorders of digestion, 2·65 (4·25). Mention is made of 2400 cases of parturition without any details; a statement of the results among this group would be interesting to the civil profession.

The medical specialist at Netley reports that disordered action of the heart (tachycardia) has no satisfactory treatment. He considers the strain of the service does not cause it, "as the young soldier leads a much more healthy life than he did before enlistment." But, we would point out, he also leads a much more strenuous life; and a report on the incidence of such cases in the large depôts might be useful (p. 33), particularly if one depôt were distinctly better fed than another; the provision of more rest and different food might have a bearing on the subject. A new diet, "scientifically balanced," was introduced abroad on Jan. 1st, 1922, but is not detailed in this report. The food of the boys of the army, at Woolwich, Chatham, and the Duke of York's School, was under consideration this year, and their diets were readjusted and improved. Venereal diseases are less frequent, especially at home. This is ascribed to better accommodation in barracks, also to the spread of temperance, to provision of preventive outfits (improved this year), and to better facilities for disinfection. Incidence in the army was 70·7 (74·0), but among the large commands, heaviest on the Rhine, 254·2. Cases of venereal disease are now treated in ordinary military hospitals, in special wards.

Medical Examination of Recruits.

The statistics are for the recruiting year, Oct. 1st, 1921, to Sept. 30th, 1922, in which 45,932 recruits were taken into the army; 40,934 born in England, 5704 in Scotland, 2013 in Ireland, and 308 elsewhere; 31,566 were rejected, either at once or within six months. The rejections, 407·31, were more numerous than in the previous year (382·81), the chief causes being sub-standard chest measurements, defective vision, ear disease, defective teeth, valvular and other diseases of the heart, flat-foot and other defects of the lower extremity. The rejections were, in this year, fewer for tubercle, defective intelligence, and diseases of the heart. The standards of chest, weight, and height which were accepted are not stated.

Hygiene.

Under this heading it is shown that, among the larger commands, venereal disease, digestive disease, and scabies were at a maximum on the Rhine, malaria in India, local injuries, diseases of the areolar tissue and tonsillitis in Egypt and Palestine, influenza in the United Kingdom, and sand-fly fever in Iraq. Malaria is being energetically and successfully controlled. The

[1] Vol. lviii., pp. iv. + 100. H.M. Stationery Office. 3s.
[2] The figures in parentheses represent corresponding number for 1921.

percentage of admissions to hospital was 65·0 (99·8), of deaths 0·16 (0·27), and of invalids finally discharged 0·17 (0·48). In West Africa 142 cases arose among 244 men; apparently at first no anophelines were found in barracks, but later it is said they were found in some, and that 7 per cent. were found to be infected. Palestine had less malaria; General Headquarters remained non-malarial, and there were no primary cases of malaria among the troops in Jerusalem. In Cyprus care was taken not to bring the troops into dangerous areas at bad seasons, but a refugee camp of heavily infected Russians spread malaria to troops near by. Gibraltar suffers through mosquitoes coming from Spain.

The incidence of diseases of the digestive system was 47·4 (58·6) for men and for officers 44·8 (56·6). The improvement is ascribed to improved rations, better cooking and serving of meals, and oral hygiene. We may note that men suffer twice as much as officers from tonsillitis.

Influenza occurred chiefly at home. An outbreak at Redford, near Edinburgh, is believed to have been aborted by obligatory gargling and insufflation with 1/5000 potassium permanganate in normal saline, the affected barracks being put out of bounds to other troops, and double cubic space given to the men. Elsewhere early isolation, disinfection of drinking cups, and inoculation were also thought useful.

In West Africa an orderly with first-aid equipment attends at all football matches to minimise loss of service to the Crown from local injuries. Mother and child welfare schemes (entirely voluntary) are proving most valuable.

The Hygiene Department of the Royal Army Medical College passed 60 senior officers through courses and 9 for the specialist certificate, as well as 37 laboratory attendants. The museum is being rearranged and improved. Many investigations were made and some reports thereon published in the *Journal of the Royal Army Medical Corps*. The Army School of Hygiene at Aldershot absorbed the school from Blackpool and the Entomological Laboratory from Sandwich. It trained 5 officers and 48 other ranks, R.A.M.C. Two men were specially trained for the sanitary inspectors' certificate. Researches were conducted on water sterilisation, and on the life-history of *A. maculipennis*. The Army Hygiene Advisory Committee dealt with the energy expenditure of the soldier in training, the soldier's load,[1] and the application of motion study to digging, and visited barracks to decide important questions of sanitation. A War Office committee investigated problems of disinfestation, disinfection, and personal cleanliness on active service.

Pathology.

The staff of this section was rearranged. Pathology and hygiene were administered in small commands by the same officer; also the directorate of pathology took over the administration of venereal disease with its associated laboratory work, and all medical problems relating to chemical warfare. At the Royal Army Medical College 60 officers were trained in general and tropical pathology, 6 as specialists, and 36 men as laboratory attendants. Progress was made in the quest of a vaccine to prevent bacillary dysentery, and other vaccines, sera, and biological reagents were prepared and supplied to the Service, saving £16,000 to the public, which was also saved expense by the inoculation, at the College, of various Colonial and Indian officials. Various notes appear here on the work proceeding at present; the Sigma reaction is being found reliable; the type of pneumococci infecting a case is now quickly recognised, in the cerebro-spinal fluid, by the precipitin test; a new antiseptic ointment for the prevention of venereal disease has been devised and issued. The increase in venereal disease in the Rhine Army received much consideration. In Malta 14 cases of Mediterranean fever were recognised, 13 in native Maltese, who are not under the same sanitary control as the British troops. In Turkey fresh cases of dysentery were always bacillary and mostly of Flexner type; Shiga infections were infrequent but extremely severe; gonorrhœa cases got benefit from autogenous, but not from stock vaccines; nine cases of enteric fever were seen; blood cultures were obtained in nearly every case from the mercantile marine, but were little successful if patients had been protectively inoculated; a small outbreak of diphtheria in a British man-of-war was controlled by the laboratory; two cases of anthrax were cured with anti-anthrax serum. The R.A.F. seem to have taken over the pathological work of Iraq, except antirabic treatment, handed over to the civil authorities. We regret to notice that the laboratory at Khartoum had to be closed. Of 462 primary malaria cases examined there, 292 were benign tertian, 157 malignant tertian, and 13 quartan.

[1] See THE LANCET, Feb. 11th, 1922.

Dental Treatment.

New dental history cards have facilitated treatment by saving time spent formerly in repeated inspections. In 1922 the army had in it 208,079 men, of whom 158,793 were inspected by dental officers; 74·23 per cent. were selected for treatment, of whom 55·68 per cent., one-third of the inspected, had treatment completed during the year. The proportion of teeth saved goes on rising. Further, not half as many artificial dentures were required in 1922 as in 1921. In addition scaling and treatment for inflammatory conditions of the mouth were also done. Reports from abroad show that men sent from home require less dental treatment than in former years. India is absent from the dental returns and remarks both in 1921 and 1922, yet we observe that India has rates just below the average for diseases of the mouth and teeth and for diseases of the digestive system. Dental treatment was completed in 1922 for 1481 wives and children of soldiers.

Command Reports.

We have noticed in the reports from the larger commands that influenza was most prevalent at home, 46·2, especially at Aldershot, 65·3, but Aldershot had the fewest cases of tubercle, pneumonia, and bronchitis; Ireland had, as last year, a low rate. The Northern Command, 7755 men, had the highest rates and the Rhine was hardly higher. The death-rate on the Rhine was 6·29, the highest in any large area, while its venereal rate, 254·2, was enormous (army generally, 70·7), yet the proportion of bachelors in that army was a minimum. This Rhine area evidently requires careful watching. Its rates for diseases of the teeth and for diseases of the digestive system are a maximum, and the women here, and the children, have death- and sickness-rates higher than those observed in the United Kingdom.

	Admission to hospital per 1000.		Death-rates per 1000.	
	U.K.	Rhine.	U.K.	Rhine.
W.O.'s, N.C.O.'s, and men	376·4	689·7	1·86	6·29
Women	75·3	106·3	2·39	3·57
Children	61·4	144·4	4·02	6·95

The report contains notes on the management of nocturnal incontinence in soldiers on p. 38, on mental cases on p. 50, and on the prevention of malaria on p. 60, to which we direct attention. The death-rate in India, 7·09 in 1921, has been reduced to 4·84, but as compared with that, 3·26, in 1913 is still too high.

There is still work to be done in the building up of a healthy army. This end has, however, been brought nearer by the campaign of the R.A.M.C. against disease, well planned in 1921, and beginning to bear good fruit in 1922, with a 20 per cent. reduction of the admissions to hospital and of the death-rate.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(*Continued from p. 786.*)

EVIDENCE OF MINERS' SOCIETIES (*continued*).

Mr. E. Hibbert and Mr. D. Shaw gave evidence for the Lancashire and Cheshire Miners' Permanent Approved Society. (Q. 6969.) With regard to the suggestion made previously that segregation of membership under occupations was producing unfortunate results, the witnesses pointed out that there are normally about 1,100,000 persons engaged in the mining industry on the surface and underground; but in the miners' societies there are only 170,000 insured persons.

(Q. 6970.) Even with this so-called segregation we should do very much better if we had dental treatment. I am sorry to trouble you so much with dental treatment, but everything seems to turn on that.

Need of Dental Benefit: Evidence of Excessive Sickness for Lack of It.

(App. XI., 24.) This society urge that this should be a statutory normal benefit and that members should pay no part—or at any rate only a very small part—of the cost of any dental services necessary. They consider that this would transform their present unfavourable sickness experience. They had asked the regional medical officers to refer in their reports to the condition of the teeth of sick members referred to them for examination.

The regional medical officers have very kindly complied with this request. It is quite obvious from those reports—and they confirm our previous impressions formed as laymen of the position of this subject—that a considerable proportion of our excessive sickness experience is due to this preventable cause.

(Q. 6984.) The witnesses suggested that miners are more in need of dental treatment than any other class.

Supply of Appliances.

(App. XI., 22.) In addition to dental treatment, the witnesses considered that the supply of certain appliances—trusses, spectacles, knee-caps—should not be dependent on favourable valuation results, but should be supplied generally, subject to a condition that their provision should enable insured persons to resume work.

Higher Rates of Sickness Benefit.

(App. XI., 10.) This society would like to have the normal rates of sickness and disablement benefits increased for married men with a rising scale for those with children under 14.

(Q. 7016–51.) With regard to sickness experience generally, the witnesses contended that by paying out sickness benefit from the date of the doctor's certificate and not from the date of receipt of the claim, their society were paying out as much as 10 per cent. in excess of what other societies in most cases were paying. They admitted that the other societies were complying with the Act of Parliament and that they were not, but suggested that the Act of Parliament was at fault. The witnesses were taken to task for quoting special circumstances in support of their contention.

(Q. 7027.) You are quoting one sort of special incident after another. First of all you quote the man who lives seven miles from the colliery; then the man whose household consists of himself and his wife; and then the case of a wave of influenza passing over the whole village. What you tell us here is, that if you habitually, and as a matter of practice, carried out what appears to be the Act of Parliament you would save 10 per cent. of your sickness claims?—Yes.

Age at Entry.

(Q. 7060–3.) The suggestion in this evidence that persons should become insured at 14 instead of 16 was not pressed when it was pointed out that this would tend to stereotype the earlier age as one suitable for children to go to work. They pointed out, however (Q. 7119), that economic necessity induces miners to send their children to work at the earlier age. In any case the principal reason for the proposal (Q. 7063) was not to secure cash benefits but to get the advantage of medical treatment.

Insurance Committees Useless.

(App. XI., 27.) This society is uncomprising in its attitude towards Insurance Committees. It considers them useless and thinks they ought to be abolished.

Complete Pooling of Funds.

For the Lancashire and Cheshire Miners' Federation Approved Society, Mr. Lee Shaw gave evidence. The evidence in this case was almost entirely on the suggestion that there should be a complete pooling of funds.

(App. XII., 3.) Approved Societies consisting of miners only are almost without exception in the unfortunate position of not being able to provide additional benefits. The fact that a heavy sickness experience and invariably a high maternity-rate experience, in connexion with such societies, has prevented the accumulation of funds to provide additional benefits in itself suggests that the need is equally great for the provision of additional benefits, and possibly greater.

(Q. 7227–67.) This witness considered that with a complete system of pooling of funds, a close central control and the strong sense of duty of local administrators would be sufficient to prevent lax administration or loss of benefit funds.

(Q. 7245–6.) Would it really not mean in the long run—it might not happen at once—that Approved Societies as we know them now would disappear?—Exactly.—Q. I want to ask you whether from the general point of view you would regard the disappearance of Approved Societies as we know them without regret?—I do not know that I should. I think that every town looking after its own insured persons could do it effectively and could administer it with that sympathy which we feel is necessary in the case of sick persons.

(Q. 7382.) The witness advocated an increase in the present rates of sickness benefit.

Pithead Baths.

(Q. 7387.) Are you of opinion that it would tend to improve the health of miners generally if we had a system of pithead baths so that men could bathe themselves properly and change their clothes and go home comfortably attired in all sorts of weathers?—Yes, I hold very definite views. It would be a great advantage to the miners if we had pithead baths, and it would appreciably improve their health.

Mr. Lee Shaw said that pithead baths were established in connexion with the Atherton Collieries and that they were very much appreciated.

EVIDENCE OF MR. ALBAN GORDON.

(App. XIII.) Mr. Gordon is secretary of the United Women's Insurance Society, but gave his evidence as an individual.

Weakness of the Approved Society System.

(App. XIII., 5.) In Mr. Gordon's view, the administrative weakness of the Approved Society system lies, first, in the enormous number of Approved Societies (8427 separate administrative units) with their consequent overlapping and duplica-

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247–8); The Provision of Medical Benefit (Feb. 7th, pp. 301–3; Feb. 14th, pp. 355–6; Feb. 21st, pp. 403–5); Financial Provisions of the Act (Feb. 28th, pp. 454–7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508–9); The Approved Societies and the Money Benefits (March 14th, pp. 564–5; March 21st, pp. 623–4); Evidence of the Hearts of Oak Society (March 28th, pp. 677–9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731–3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784–6).

References to the printed statements issued as appendices to the reports of the oral evidence are given thus; Section A, para. 69, is shown as "App. A. 69," and references to the oral evidence thus—Q. 1369.

tion of machinery, and in the small size and membership distribution of many of them. The system, he says, stands condemned for the following amongst other reasons: (9) the undesirable competition between the societies; (10) the overlapping and wasted effort; (12) the elaborate central machinery necessary to supervise them, and (14) the farcical nature of the so-called democratic machinery. (16) The vested interests in their own posts or in their organisations, says Mr. Gordon, coloured the views of society officials on the working of the National Health Insurance Acts.

Political Dangers.

(App. XIII., 17.) As an illustration of the political dangers attaching to the present system, the witness referred to the bitter dispute between the societies and the medical profession in 1923 and to the setting up of an Emergency Committee of Societies to bring pressure to bear on Parliamentary candidates.

Of the 15 million insured persons,

probably 14¾ million had not even the knowledge that the controversy was taking place, still less as to the true merits of it. The "Emergency Committee" had not the slightest vestige of claim to represent anybody, yet by virtue of the mock-democracy of the Approved Society system it wielded the political authority of 15 million persons, largely electors.

A Territorial Organisation.

(App. XIII., 20.) Mr. Gordon considers that the objections to the Approved Society system of administration could be met

by regrouping Approved Societies on a territorial basis, and setting up one Approved Society for each county or county borough, or other local unit, with or without the possibility of local occupational societies where the number of persons engaged in the same occupation in any given locality was sufficiently numerous for a special society to be set up for the employees in that industry in the locality should they so desire.

(App. XIII., 21.) Although he thinks that the continued existence of Insurance Committees with their present limitations is, except for the functions performed by the Medical Service Subcommittee, a pure farce, Mr. Gordon considers that

these bodies, being on a territorial basis, command a great deal of public-spirited service which could well be utilised to better purpose, and the suggestion comes naturally to mind that the machinery of Insurance Committees might form the basis of a new type of Approved Society.

(Q. 7798.) As to the Medical Service Subcommittees, Mr. Gordon said that they very often work in an erratic and capricious fashion but that the system is right.

(Q. 7452.) The witness's plan is to take "suitable local areas"—and in this connexion it is to be borne in mind that a Royal Commission on Local Government areas is now sitting—and have an Approved Society for each area administering cash benefits, and a co-terminous organisation, a Health Council, administering medical benefit and in fact all local medical and sanitary services.

What is to Happen to the Old Friendly Societies.

(Q. 7581.) The present work of the old Friendly Societies in the provision of cash payments during sickness is, says Mr. Gordon, obsolescent. They led the way for many years, but the State has now caught them up.

The old work of Friendly Societies seems to me to be done, and it is not for them now to try and stand in the way and say: "This is our sphere, and nothing else must be done in this sphere." I think it is for the Friendly Society vanguard, having been caught up by the main army now, to move on into other spheres.

(Q. 7505.) Though describing himself as a very strong lover of Friendly Societies, Mr. Gordon said that he felt that

what is popularly called the Friendly Society spirit to-day is growing to be a definite hindrance in National Insurance administration and definitely contrary to the good both of Friendly Societies and of National Social Insurance.

Grave Defects of Medical Benefit.

(App. XIII., 31–48.) Mr. Gordon would take medical benefit altogether out of the Insurance Act; he suggests that it is a misuse of terms to call it part of an "insurance scheme" in view of the fact that scarcely any element of uncertainty enters into its financial side.

The grave defects of medical benefit—so grave as almost to merit the description tragic—are: (1) the narrow limits assigned to the range of services to be rendered as medical benefit; and (2) the entire absence of any coördination between medical benefit and other branches of medical or public health services.

In addition, the present system possesses the considerable fault of being unduly expensive. The part-time basis of remunerating practitioners is "extremely wasteful." The capitation fee had been unduly inflated because

in calculating the remuneration of panel practitioners regard had to be taken of the establishment and overhead charges of as many surgeries as there were practitioners. Every separate doctor, or partnership of doctors, maintains his separate waiting room or rooms, often crowded, inconvenient, and even insanitary, his own consulting-room, his own filing and clerical system, his own means of transport.

A National Medical Service.

(App. XIII., 42.) This witness would have a comprehensive national scheme of medical services. Although personally in favour of a salaried organisation, he thought a capitation system of payment a possible though a more costly and less efficient method. He commended to the notice of the Commission the scheme drawn up by Lord Dawson's Committee (Cmd. 693, 1920) and, as regards hospitals, the Labour Party Caxton Hall resolutions of April, 1924. He thought it clear

that the policy of these resolutions could be so developed that the hospital services of the country could be augmented, improved, and brought into close relationship with a National Medical Service without derogation of the magnificent amount of voluntary work that for many years has been such an admirable feature of British hospitals.

Free Choice of Doctor a Superstition.

(Q. 7842.) Would you retain free choice of doctor for the patient?—In the face of circumstances, yes, although I cannot help regarding that as a survival of the superstitious side of medicine.

(Q. 7858.) Both from the point of view of the patient and from the point of view of the doctor it is highly desirable that the patient should have free choice?—I agree in the present state of public opinion, but I do not agree intrinsically.

Team-Work amongst Doctors.

(App. XIII., 40 and Q. 7870.) Mr. Gordon suggested that, apart from statutory reforms, it would be a great step forward if general practitioners could be linked up together in groups, so that instead of every man providing his own waiting-room, consulting-room, &c., groups of doctors might work in well-designed and well-equipped suites of waiting- and consulting-rooms, with properly qualified attendants, nurses, clerical assistants, &c. This would permit of some degree of specialisation and it would facilitate holidays, periods of study, &c., among the doctors concerned, while the patients would receive quicker and more effective attention. Such a reform must develop amongst the doctors themselves but might be "gently assisted" from without.

KING EDWARD VII. SANATORIUM, MIDHURST.—From the eighteenth annual report dealing with the period July, 1923, to July, 1924, it will be seen that 294 patients were admitted to the sanatorium, including 20 readmissions and 19 who remained in residence too short a time to be considered in the records. During the same period 234 patients were discharged, of whom 65 were placed in Group 1 (disease of slight severity limited to small areas of one lobe on either side), 44 in Group 2 (diseases of slight severity, more extensive than Group 1, but affecting at most the whole of one lobe), and 125 in Group 3 (all cases of greater severity than Group 2). A steady demand for beds is recorded, the average number of patients on the waiting-list per week having been, for men 6·3 and for women 6·7.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

POST-GRADUATE EDUCATION.

THE resumed discussion[1] on this subject took place on April 8th, Sir Arbuthnot Lane, President of the Fellowship, being in the chair.

Sir Thomas Horder said that the discussion had already shown a general agreement as to the need for post-graduate teaching and the desirability of extending the present activities of the Fellowship. The post-graduate habit in this country needed stimulating and it was from within the profession that that stimulus should come. Four suggestions might be considered: (1) That the panel of those willing to assist in post-graduate work should be made smaller, containing only carefully selected names. (2) That the teaching staffs of undergraduate schools should be recaptured for this work. The speaker was sure that they would be willing to assist. (3) That it was imperative for the Fellowship to find a home of its own, if only a room, some temporary fabric where tuition could be carried on. (4) That a hospital was essential. The Fellowship should never rest satisfied with any scheme which did not include a college for teaching and a hospital for practice.

Dr. W. Griffith said that it was unanimously admitted that any medical service to be adequate must keep up post-graduate work. The military and naval services made arrangements for this; the national health insurance service did not. He suggested that the Minister of Health should be approached with a view to some scheme whereby panel practitioners could be given periodical study-leave at the expense of the Ministry, and that one of the large general hospitals should be established as a centre of post-graduate study.

Dr. F. Hernaman-Johnson spoke of the genesis and work of the Radiological Institute. They had found that nothing could be done until a home had been obtained. It was hoped that the Institute with its X ray museum would be able to help with post-graduate work next autumn. He thought that there was a reciprocal duty on the part of the teachers and the Fellowship; the former should be there at the time appointed, while the latter should undertake to provide him with somebody to teach. Neither of these duties was always fulfilled.

Sir James Dundas-Grant described the work of the old Polyclinic, which had done such valuable service in providing daily demonstrations by members of hospital staffs followed by lectures, commencing at 5.15 and given by the same teachers or by members of consulting staffs, the nature of the demonstration being fixed for each day of the week. A nominal annual subscription entitled practitioners to attend these classes, and although no honorarium was offered plenty of distinguished men came forward to assist in the provision of them. He suggested that something on these lines might be started at once.

Mr. F. J. McCann said that the time had come when the Fellowship ought to be able to lead an independent existence. It needed money, a home, and a man. He suggested that an appeal should be launched from the Mansion House for £50,000; the public could be interested and made to realise that to contribute to better medical education was one of the best methods of life insurance. There should be a college and a hospital and the two should be linked by links of gold, the lecturers being well paid for their work. At the head of it should be one capable man to resolve conflicting interests and ensure harmonious working.

Mr. H. W. Carson spoke of the difficulty of getting the whole profession on the side of post-graduate education; the undergraduate teaching staffs did not so much need "recapturing" as interesting in the first place. Many foreigners coming to London were disappointed at finding that there was no way of seeing the work of certain world-renowned practitioners. The provision of a central hospital had many difficulties; it did not seem likely that any existing one would consent to devote itself to post-graduate work and to build one would be a colossal undertaking; the staff of such an institution must either be fixed, providing a very limited number of teachers or, if it were fluctuating, the hospital would be run with much difficulty and the turn of some people would be long in coming. On the other hand, a home and hostel was absolutely essential, with someone in charge of it. At the North-East London Post-Graduate College it had been found a successful plan to allow local practitioners to become members of the College for a small subscription. This enabled them to use the hospital when they liked. He suggested that the Fellowship should invite local hospital centres to receive members of teaching staffs for the purpose of conducting demonstrations.

Dr. Sophia Jevons said that she spoke as a student and was disappointed to hear no practical schemes put forward; all these suggestions were very idealistic, and demanded large sums of money and time for their development. The public were willing to subscribe for a cancer fund because they were terrified of getting cancer; they would never subscribe to a fund for medical education.

Dr. Bernard Myers said that what people who came to the classes wanted were cases they could examine themselves, chiefly common cases, with a few rare ones, clinical lectures and demonstrations giving detailed differential diagnosis, prognosis, and treatment with pathological specimens. They liked their teachers to be authorities on the particular subject under discussion. The American visitors had told him that they saw better cases in London than in any part of the world. A centre would be advantageous and Bloomsbury was the place for it; the hostel suggested by Sir Thomas Horder was very necessary and practical. General practitioners wanted to be able to attend classes at some local hospital where they were within telephone call of their work. He suggested that teachers might be sent out to cottage hospitals to take the work of the day in them. He was certain that if a reasonable sum were asked for it would be obtained.

Sir Henry Simson said that the Polyclinic failed because it provided too many lectures; the post-graduate student wanted to examine cases. There were four types of student: (1) The man who came to see the work of some particular individual. It should be possible for the Fellowship to give him a card of introduction and to communicate with that person on the telephone informing him of the arrival of the visitor. (2) The man who wanted demonstrations in special subjects. (3) The man who wanted three or four weeks' work in general medical knowledge. For him there were already four hospitals in London if he chose to attend them—the North-Eastern, the Royal Northern, the West London, and the Hampstead General. (4) The general practitioner who wanted classes on one day a week.

Prof. Louise McIlroy said that there was a great demand for and a grave lack of provision of obstetric teaching in London. Some special scheme was needed whereby a course in this subject could be arranged three or four times a year. More and more antenatal clinics were being established and the local practitioners were expected to be competent in this subject; it was possible that the Ministry of Health might support some arrangement for training medical officers for these centres.

Mr. E. B. Turner expressed his agreement with Sir Thomas Horder and Dr. Myers; in his opinion the immediate provision of a home and hostel were within the realm of practical politics; the latter might, indeed, be made a commercial speculation. Post-graduates wanted training in the technical

[1] THE LANCET, March 28th, p. 681.

management of cases requiring modern methods of treatment. The present hospitals providing post-graduate work were rather far from the centre. He wondered why more use was not made of the excellent material provided in the Poor-law institutions. Study-leave for panel practitioners was an excellent idea, but most panel practitioners were also engaged in private practice, and even if allowed leave from their panels might not find it easy to escape the multifarious calls of private work.

A letter from an overseas post-graduate student was read by Dr. A. J. Whiting, criticising present arrangements on the grounds of the time wasted in getting across London, in the late attendance or failure to attend of appointed teachers, and the inability of some teachers to teach. He suggested that concentrated courses of a month's tuition consisting of six or seven hours a day for seven days a week should be provided to include the examination of selected out-patients, demonstrated by a first-class person, with an exposition of his own views and those of other eminent people as to all modern methods of differential diagnosis and treatment; attendance at operations in all branches, frequent demonstrations on the cadaver, constant revision of anatomy, &c. He would not want to hear lectures or see large collections of cases or to suffer long disquisitions on theory or the autobiography of the teacher. The young graduate should be separated from the man who had been specialising some time.

Mr. J. P. Lockhart-Mummery said the difficulty was a financial one. He had been treasurer of the old Polyclinic and they had always been held up by lack of funds. The post-graduate must put up what money was required himself; the public would not help. The material was all to hand, but unless 5000 practitioners could be found to subscribe £1 a year each towards organisation that material could not be properly utilised.

Dr. R. A. Gibbons agreed with Mr. Lockhart-Mummery, and thought that the profession might be appealed to for a moderate subscription.

Dr. C. M. Wilson said it was most important to find out what they were trying to do. In his experience the general practitioner would not come in large numbers for a period of two or three weeks, but he would come one day a week for special lectures if the man he wanted was there to lecture. The teaching technique was a most important factor; the formation of a new polyclinic would only solve the problem if the teachers were most carefully selected. In Berlin the arrangements were much more convenient as the best people were all concentrated at the University. A practical difficulty was that if the popular teacher gave demonstrations they would soon cease to be demonstrations because so many people would attend them.

Mr. H. J. Paterson said that the London Temperance Hospital had decided to give an experimental course of two weeks' tuition daily at 4.30, consisting of an hour's demonstration of cases followed by a short lecture, the subscription being one guinea.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Heidelberg as a Spa.

THE ancient city of Heidelberg, renowned for its very old university, the ruins of its castle, and its picturesque site, has now added the attraction of a watering place. A spring has been found at a depth of 1000 metres, containing sodium chloride, carbonic acid, and radium, without the presence of sulphates. The spring will be useful to patients suffering from rheumatism, gout, neuralgia, sciatica, arterio-sclerosis, bronchitis, gastric and intestinal catarrh, rickets, and scrofula. The city authorities are anxious to make Heidelberg a first-class spa; the construction of a modern bathing establishment is proposed and other arrangments to secure an efficacious "cure" will be made. They hope that not only the spring and the attractions of the old city, but also the fact that the patients have during their stay the opportunity of consulting leading medical men who belong to the university, will bring a number of visitors.

Poisoning by Ginger-Bread.

Some cases of arsenical poisoning by ginger-bread have recently been observed in Breslau. It was ascertained that the potash which is usually added to the dough to make it softer contained arsenic. The potash had been extracted from the wool of sheep which had previously been treated with arsenic compounds. The Health Office has therefore instructed druggists and chemists to ascertain whether the potash for sale contains arsenic, in which case it is enacted, naturally, that it must not be sold for cooking purposes.

An Unusual Danger.

A doctor of Fürstenwalde, near Berlin, was lately consulted by a man who came, in the guise of a patient, accompanied by an attendant. The latter was supposed to be necessary because the patient alleged himself to have contracted an injury which prevented him from walking upright. He came, therefore, creeping, so that the medical man could not see his face. When the medical man bowed to examine him, the patient tried to strangle him by getting hold of his neck, whilst the companion tried to stab him. Notwithstanding his age, 63, the medical man was able to hold his own until his servant arrived. The assailants fled but were arrested by the police and were sentenced to four and six years' hard labour.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Pre-Natal Work in Paris.

Prof. A. Couvelaire, of the Baudelocque Hospital, in an account of the pre-natal work to which he has contributed much during the last few years, points out that it is insufficient, and often useless, to protect the child only from the moment of its birth. Insufficient because in France nearly 35,000 infants die annually within a few hours of birth, in the last few months of pregnancy, or during labour. Useless because out of the 70,000 to 80,000 infants who die annually in France before reaching the age of one year, more than one-third die because they have been born prematurely or suffer from some congenital disease. Of every 100,000 to 110,000 infants dying between the sixth month of pregnancy and the first year, over 50,000 suffer from pathological conditions existing prior to their birth or die from the effects of difficult labour. Prof. Couvelaire calculates that nearly half the deaths of infants during pregnancy are due to syphilis (41 per cent. of unmistakable syphilis, 17 per cent. of suspected syphilis), and one-sixth are due to other pathological conditions. He publishes some interesting graphs showing the influence of modern specific treatment on syphilis complicated by pregnancy. At the Baudelocque Hospital the death-rate among syphilitics during the first year of life was 62 per cent. when the mother and infant were not treated, it was 26 per cent. when the mother, but not the infant, was treated, and it was only 5 per cent. when both mother and infant were given specific treatment. The pre-natal mortality from syphilis during the last three months of pregnancy also varied greatly, according as the mother was or was not treated. In the first case it was only 30 per cent., whereas it was 70 per cent. when the syphilis, contracted during pregnancy, was not treated. When the syphilis of the mother was of old standing the infant mortality during the last three months of pregnancy was only 8 per cent. when the mothers were given specific treatment, whereas it was 20 per cent. when the mothers were not treated.[1]

[1] The World's Health, March, 1925.

Early in 1919 Prof. Couvelaire and Dr. M. Pinard opened a dispensary for the diagnosis and treatment of congenital diseases attached to the Baudelocque Hospital, and there are now 28 such dispensaries under the supervision of specialists in obstetrics and syphilis and subsidised by the Ministry of Health. Attached to the Baudelocque Hospital there is also a small maternity home reserved for mothers suffering from tuberculosis and connected with the system of isolating new-born infants from their parents, associated with the names of Grancher and Leon Bernard. Though much has been done in France for infants both before and after birth, Prof. Couvelaire insists that there is still plenty of room for improvement, and he would like to make the early notification of pregnancy compulsory so that timely measures could be taken to prevent disasters which cannot be averted when a medical examination is not made before birth. The examinations he would like to see introduced include, among others, an early obstetrical examination, tests of the urine for albumin and the blood for a Wassermann reaction, radiography, and measuring the blood pressure. He is surely not exorbitant in his demand that "future mothers should have, at least, the same care as that given by breeders to domestic animals."

A Legal Aspect of Gland Grafting for Cretinism.

Dr. Le Fort, who distinguished himself during the war by the skill with which he abstracted bullets and pieces of shell from the neck, has recently got into difficulties with the law on account of a thyroid grafting operation. The donor of the gland was a guillotined criminal, and the recipient was a child suffering from myxœdema and cretinism. Complete success has apparently attended Dr. Le Fort's efforts. The child, a girl 2½ years old, was emotionally inert at the time of the operation, and the first sign of success was observed when she burst out crying, for the first time in her life, on being deprived of a doll which had been given her a few days earlier. She can now laugh and cry. Dr. Le Fort is satisfied with his operation from the strictly scientific and humanitarian points of view. But, unfortunately for Dr. Le Fort, there are other factors in the world besides science and the relief of suffering. There is, for example, the law. And it appears that the authorities are perplexed as to what action to take. They ask: Had Dr. Le Fort the right to purloin any of the appurtenances of the criminal without having first obtained his permission? It might be argued that the criminal had no rights in this matter; that the State having possessed itself so completely of him as to decapitate him, it is rather with the State than with the criminal that Dr. Le Fort has fallen foul. The matter is of some practical importance, as gland grafting seems still to be in the fashion at the present time.

Oculists versus Opticians.

An interesting action between the Paris Medical Society and the Society of Opticians has just been decided before the Ninth Court of Paris. An optician had carried out an ophthalmoscopic examination in order to determine what glasses a person, who had gone to him for advice, should wear. The oculists argued through their society that, by using such a method, the optician had been guilty of the illegal practice of medicine. The Court finally accepted this view, giving judgment against the optician. The case is of interest for this, among other reasons, that it shows how with us, as with you in England, oculists and opticians do not always see eye to eye.

ROYAL MEDICAL BENEVOLENT FUND BALL.—The Kensington division of the British Medical Association is promoting a ball, the profits on which will be given to the Royal Medical Benevolent Fund and its Guild. Under the patronage of H.R.H. Princess Louise, Duchess of Argyll, the ball will take place on Thursday, May 7th, from 9 P.M. to 2 A.M., at the Kensington Town Hall, and tickets, at 1 guinea each or six for 5 guineas, can be obtained from the honorary secretary, Dr. Howard Stratford, 20, Upper Phillimore-place, Kensington, W. 8.

BUCHAREST.

(FROM OUR OWN CORRESPONDENT.)

Deaths Ascribed to Neosalvarsan.

SEVERAL deaths have occurred lately in Roumania following the administration of neosalvarsan. The first case occurred in Targoviste, where a military officer died 36 hours after the intravenous injection of 0·60 g. of neosalvarsan. His death started a great press agitation, in which the neosalvarsan preparation was indicted as the cause of the fatal issue, and certain newspapers even went so far as to say that the Germans were selling poisonous preparations to Roumania in order to devastate the Roumanians. The *Lupta*, a daily paper of good repute, writes as follows: "It is impossible to inundate the whole world with such preparations without the knowledge of the German factory, because several such cases occurred also in France. It is possible, therefore, that we have to deal with a terrible revenge against the Allies, or an unheard-of crime committed by carelessness." Other journals, more moderate, demanded thorough investigation. Thereupon the head of the sanitary department of the Ministry of War travelled to Targoviste. The analytical examination of the organs of the deceased revealed that death was due to the erroneous combination of the preparation. In the two fatal cases which occurred in Bucharest shortly after the above case, post-mortem examinations revealed that the fatal issue was attributable to a faulty preparation of the drug. The Minister of Public Heath has ordered that specimens shall be taken from all the wholesale drug-stores of the land and that these be analysed in the State chemical laboratory. The matter was also brought up in the Senate, where M. Saveanu, Minister of Public Health, replied that everything would be done in order to find out how the harmful preparations got into the country, and that any guilty parties would be adequately punished. On the same occasion the Minister said that a new law would be formulated regulating the admission of foreign preparations into Roumania, and those not on the list of permissible preparations would be confiscated in the Custom houses. The medical papers of Roumania are unanimous in saying that the preparations which have caused the deaths in question must have been smuggled preparations, which are cheap imitations of the original neosalvarsan, and are manufactured wholesale, but not in Germany.

A Strange Method of Controlling Doctors' Incomes.

The financial director of the tax office in a city in the Banat (a province in Roumania) has invented a novel method of controlling the income of physicians, from the point of view of taxation. He has sent a circular to all pharmacists in his district, ordering them to keep special ledgers for noting the prescriptions written by medical men and to submit the list at the end of every quarter to the tax office for inspection. The medical and pharmaceutical press is very much embarrassed by this proposal, which looks likely to injure friendly relations between physicians and pharmacists. They say that the system is valueless as an index of the physician's income, because if, for instance, Dr. X. writes 500 prescriptions in a year, the ledger will display more than 2000 prescriptions under his name, since the patients, as a rule, repeat one prescription four or five times. On the other hand, a surgeon may earn five times as much as a physician, although he does not write the fifth part of the prescriptions a physician does. Such a system would surely only tempt doctors to avoid writing prescriptions, even in cases where domestic medicines were out of place.

Roumanian Insulin.

Dr. Nitescu, professor of physiology at the University of Cluj, has invented a method whereby he is

able to produce a very pure quality of insulin. The preparation, he claims, exceeds all other European insulins in efficacy and is equal to the Toronto insulin. The preparation has been given a trial in the clinics of the Cluj, Bucharest, and Jassy Universities. The results obtained were equal to those obtained with foreign-made insulins. Prof. Nitescu, however, has refused all commercial offers made by foreign concerns, as he wants to control the manufacture of his insulin himself.

The Success of the Abortive Treatment of Gonorrhœa.

Dr. Marinescu, lecturer at the University of Bucharest, writes in the *Romania Medicala* that the successful result of abortive treatment of an incipient gonorrhœa depends upon nine conditions: (1) Treatment to follow coitus within 36 hours. (2) Normal incubation. With excessive virulence the incubation is shorter. (3) The urethral orifice not be red, nor swollen, these symptoms being the signs of great virulence. (4) No thick filaments in the urine, thin threads only are permissible. (5) The urine not turbid. (6) The microscopical examination must reveal the presence of extra-cellular gonococci only. (7) The patient must not have treated himself previously, because bad treatment endangers the success of the abortive treatment. (8) Abortive treatment must always be made by the doctor himself and never by the patient. (9) The treatment must be continued for 10 to 12 days. According to Dr. Marinescu, two therapeutic methods deserve our attention: the urethro-vesical irrigations and the urethral irrigations, or both combined. He advocates 10 per cent. argyrol solution. The first lavage serves to wash out the urethra and it has to be let out immediately, the second injection only is retained for 4 to 6 minutes. This has to be repeated 3 or 4 times a day. If the urethra becomes tender during the course of treatment, and the first part of the urine contains purulent filaments, the irrigations have to be applied less frequently. The treatment has to be continued for at least 10 to 12 days, even if the secretion becomes gonococcus-free earlier. The success of the treatment can be promoted by the administration of internal urinary antiseptics and vaccines.

Conference for Defeating Malaria.

The Supreme Sanitary Commission held a conference in the last week of March in Bucharest to discuss the best methods of successfully exterminating malaria from Roumania. Most of the clinicians of the Roumanian universities were present, and also very many rural doctors. The conference resolved, upon the proposal of Prof. Cantacuzino and Prof. Mezinicescu, to hold a course in the laboratory of Prof. Cantacuzino in Jassy, for the teaching of modern methods of fighting malaria. The courses will be attended by all laboratory doctors of Roumania in successive groups. One course lasts four weeks, and will be free of expense for those taking part. After the termination of the course the campaign against malaria will be commenced in all swampy parts of the country and especially in the swampy district of the Dobrudja.

DONATIONS AND BEQUESTS.—The late Mrs. Sarah Anne Morgan, of Blaenavon, Mon., left £1050 to the Cardiff Royal Infirmary and £100 to Dr. Barnardo's Homes.—Mr. Samuel Wild, cotton spinner, of Oldham, bequeathed 2000 guineas to the Oldham Infirmary for the endowment of two beds in memory of his wife and his sister Mary, 250 guineas to St. Dunstan's Hostel for the Blind, and 115 guineas to Henshaw's Asylum for the Blind.—Mrs. Alice Margaret Bowerman, of Bath, left £300 to Epsom College Benevolent Association, and £200 each to the Mineral Water Hospital, Bath, and the Combe Down Convalescent Home.—Mrs. Ann Zilah Newton, of Derby, who left £5970, subject to certain life interests, bequeathed her estate to the Derbyshire Royal Infirmary.

Correspondence.

"Audi alteram partem."

HOW TO BLOW THE NOSE.

To the Editor of THE LANCET.

SIR,—With reference to a recent contribution on this subject, if this were properly understood and properly taught, I am certain that the health of innumerable poor catarrhal children who crowd our clinics would be immensely improved, and the number of ear cases greatly reduced. In a leading article in your issue of Feb. 14th you give a timely reminder of the hygiene of the nose, and you give careful instructions in, what you consider to be, the proper method of blowing the nose. Although you are in agreement with most text-books, nevertheless, in my opinion, it is not the proper method nor the safest method. Very many of the catarrhal cases have a one-sided block, of greater or less degree, due to septal deviation, polypi, hypertrophied turbinals, &c. So that your instructions "to close one nostril with a finger and blow steadily and strongly down the other and repeat the process through the other nostril" would result in the patient, during one of the efforts, blowing steadily and strongly against an almost completely blocked nose, a danger which you rightly say must be avoided. For many years I have urged that there is but one safe and efficient way of blowing the nose, and it is as follows. Take an inspiration through the mouth, close both lips, and blow down both nostrils. Repeat until the nose is clear. This should be the method after all douching. When a handkerchief is used it should be held loosely round the nose—no pinching of the nose. With these precautions there need be no anxiety about middle-ear infection per Eustachian tube.

I am, Sir, yours faithfully,

Leeds, April 11th, 1925. A. D. SHARP.

CHOLECYSTECTOMY

AVOIDANCE OF INJURY TO THE COMMON DUCT.

To the Editor of THE LANCET.

SIR,—Recent correspondence anent intubation of the common bile-duct for stricture caused by maladroit operations in cholecystectomy, prompts me to crave for space again[1] to call attention to the most effective method for removal of a gall-bag—which eliminates all reasonable possibility of undue encroachment on the common duct.

1. The affected vesicle is seized by two strong pressure forceps by which it is drawn downwards and forwards by "opposite" assistants.

2. The peritoneal reflection at the junction of the liver and gall-bag is then lightly divided with a scalpel sufficient to admit the application of a roll of dry gauze which, within a few seconds, by rotatory action, freely separates the viscus from the fossa fellea down below the level of the orifice (gall-bladder) of the cystic duct.

3. A small sterilised tray is then placed beneath the protruding gall-bag, which is at once divided by the scalpel, between the forceps previously attached, and its contents evacuated.

4. A few more pressure forceps are then applied in order securely to grip the edges of the wound. These forceps, with the tip of the left index finger fixed in the orifice of the cystic duct, are grasped in the palm of the left hand, while with the right fingers a thorough examination of the cystic, common, and hepatic ducts is executed.

5. If a calculus is found in the cystic duct it is usually kneaded between the right fingers into the gall-bag, if found in the common duct the operator walks round[2] to the left side of the patient—and the assistant

[1] THE LANCET, Sept. 20th, 1913.
[2] The Annals of Surgery, August, 1922.

with whom he has changed places seizes the forceps on the gall-bag making due traction on the same—while the operator inserts his left index finger supine into the foramen of Winslow, by which he advances and fixes the common duct so as to admit of safe incision. This effected, the calculus is turned out. A further thorough examination of the common and hepatic ducts is now made between the left index finger posteriorly and the left thumb anteriorly, and if any more gall-stones are found they are coaxed between these fingers to the exit previously made in the common duct. This wound is not sutured—it invariably closes per se within 20 days.

6. Cholecystectomy. The operator standing on the right side of the patient—with the tip of the left index finger just fixed in the opening of the cystic duct, and with the forceps grasping the gall-bladder in the palm of the left hand—makes gentle downward and forward traction so as to admit of the assistant placing a stout ligature around the cystic duct, just proximal to the bulge made from within by the operator's left index tip. The gall-bag is then clipped away with scissors—and as this is being executed a new forceps is applied to the edges of the stump so as to be able subsequently to ligate any bleeding point. A large wisp of silkworm gut is introduced into the depth and the rest of the external wound closed by interrupted double silkworm-gut sutures.

I do not know of any more safe or rapid procedure in abdominal surgery.

I am, Sir, yours faithfully,

Buenos Aires, Feb. 1st, 1925. JOHN O'CONOR.

THE DISCOVERY OF THE "BACTERIOPHAGE."

To the Editor of THE LANCET.

SIR,—In "Martin Arrowsmith," reviewed on March 14th, the author gives the credit for the discovery of the phenomenon of bacterial lysis caused by a contagious filter-passing material to Dr. d'Herelle of the Pasteur Institute. You may remember, however, that in my paper on the Ultra-microscopic Viruses, which was published in THE LANCET of Dec. 4th, 1915, I described the fundamental characters of this lysin—or virus—associated with different bacteria. I showed that it was present in the intestinal tract of man and dogs, and in most specimens of glycerinated calf vaccinia lymph. I pointed out that it passed the finest porcelain filters, that it infected bacteria, and that it could be transmitted from culture to culture indefinitely, besides describing many other characters. I also discussed the nature of the substance, and considered the possibility of its being an ultra-microscopic virus, and of there being different varieties according to the species of bacteria infected. I suggested, moreover, that it would probably be found associated with the dysentery bacilli. At the time of the publication of the paper I was asked to undertake duties in the army in Salonika, and I had no opportunity to work out any additional details connected with the phenomenon, although when in Salonika the whole subject was discussed with the Canadian, French, and British medical officers there. The first work of d'Herelle on the "lysin," named by him the "bacteriophage," associated with the dysentery bacilli was not published until nearly two years after the appearance of my paper.

I am, Sir, yours faithfully,

F. W. TWORT.

The Brown Institution (University of London),
149, Wandsworth-road, London, S.W.,
April 14th, 1925.

*** We have referred to the matter in our columns as the Twort-d'Herelle phenomenon on more than one occasion.—ED. L.

HOSPITAL SATURDAY FUNDS.—The Metropolitan Hospital Saturday Fund last year raised a total of £107,342, an increase upon 1923 of £6577. The number of hospitals and other institutions benefited was 230. Birmingham Hospital Saturday Fund collected £57,760, an improvement of £4386. The committee announce that the abolition of the ticket system is being "seriously considered."

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, April 21st.

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1925–26.

GENERAL MEETING OF FELLOWS: at 5.30 P.M.
Ballot for election to the Fellowship.

Thursday, April 23rd.

EPIDEMIOLOGY AND STATE MEDICINE: at 5.30 P.M.
Paper:
Dr. Monckton Copeman: Immunisation against Scarlet Fever.

UROLOGY: at 8.30 P.M.
Discussion:
Bacterial Infections of the Urinary Tract.
Openers:
Prof. Leonard S. Dudgeon (Pathological), Dr. E. Lepper (Experimental), Sir John Thomson-Walker (Diagnosis and Treatment).

Friday, April 24th.

STUDY OF DISEASE IN CHILDREN: at 8.30 P.M.
Discussion:
Is the Modification of Cow's Milk Necessary in Infant Feeding?
Openers:
Dr. Leonard Findlay, Dr. Eric Pritchard, Dr. Hugh Thursfield, and Dr. R. C. Jewesbury.

ROYAL INSTITUTION, 21, Albemarle-street, W.
TUESDAY, April 21st.—5.15 P.M., Prof. J. Barcroft: Effects of Climate on the Circulation. (I.)
SATURDAY.—3 P.M., Mr. W. P. Pycraft: Use and Disuse—Effect on Structure of Animals. I.)

MEDICO-LEGAL SOCIETY (President: The Rt. Hon. Lord Justice Atkin), 11, Chandos-street, Cavendish-square, W.
TUESDAY, April 21st.—8.30 P.M., A paper will be read by the Rt. Hon. Lord Riddell on the Legal Responsibility of the Surgeon. To be followed by a discussion. Members may introduce guests on production of a Member's private card.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, April 24th.—8.30 P.M., Papers will be read by Dr. H. H. Dale and Mr. David Lees on the Toxic Effects of Arseno-Benzol Treatment and Their Prevention. A Discussion will follow.

BRITISH PSYCHOLOGICAL SOCIETY (Medical Section) (at the House of the Medical Society of London, 11, Chandos-street, W.).
WEDNESDAY, April 22nd.—8.30 P.M., Dr. A. Wohlegemuth: The "Synthesis" of an Anxiety-Neurosis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, April 20th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients.
THURSDAY.—11 A.M., Sir Henry Simson: Gynæcological Wards. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 2 P.M., Mr. Simmonds: Surgical Out-patients.
FRIDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Nose, Throat, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, April 24th.—4 P.M., Dr. Andrew Wylie: Dysphagia.

MANCHESTER BABIES' HOSPITAL POST-GRADUATE LECTURES.
FRIDAY, April 17th.—8 P.M., Dr. Leonard Parsons: The Rôle of Fats in the Production and Treatment of Infantile Atrophy.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, April 21st.—4.15 P.M., Dr. F. E. Tylecote: Hilum Tuberculosis.
FRIDAY.—4.15 P.M., Demonstration of Cases. Medical: Dr. F. Craven Moore. Surgical: Mr. J. Morley.

Parliamentary Intelligence.

HOUSE OF COMMONS.

Easter Recess.

PARLIAMENT adjourned on Thursday, April 9th, for the Easter Recess. It will reassemble on Tuesday, April 28th.

MONDAY, APRIL 6TH.

International Arsenic Imports.

Captain MOREING asked the President of the Board of Trade what quantities of arsenic were imported into the United Kingdom from countries other than Japan during December, 1924, and January and February, 1925, respectively, giving the countries of origin.—Mr. A. M. SAMUEL (Parliamentary Secretary to the Overseas Trade Department) replied: The following statement shows the quantities of arsenic and arsenic compounds imported into Great Britain and Northern Ireland and registered as consigned from the countries named during the months specified. The actual countries of origin as distinguished from countries from whence goods are consigned are not recorded in the trade returns of the United Kingdom.

Articles and countries whence consigned.	December, 1924.	January, 1925.	February, 1925.
Arsenic (Metal).	lb.	lb.	lb.
Germany	—	—	3360
Arsenic, White.	Tons.	Tons.	Tons.
Belgium	10	30	37
France	—	—	10
Portugal	60	120	66
United States of America ..	10	10	—
Brazil	28	27	—
Other Arsenic Compounds.	Tons.	Tons.	Tons.
Netherlands	—	1	3
Belgium	6	5	5
France	31	—	—
Mexico	—	—	5

Scottish Vital Statistics.

The House went into Committee of Supply on a Vote of £1,976,885 for the salaries and expenses of the Scottish Board of Health.

Captain ELLIOT (Parliamentary Under Secretary for Health, Scotland) said that the public health record last year was unsatisfactory. The vital statistics moved adversely. The death-rate, which was 12·9 per 1000 in 1923, moved up to 14·4 per 1000 for 1924. The infantile mortality, which was 79 in 1923, moved up to 98 and the sickness statistics also moved in an adverse direction, the insurance returns showing a rise of from 15 to 20 per cent. all over. The tuberculosis death-rate, however, was as favourable, or slightly more favourable, than those of the previous year. He had investigated the returns as far as he could and it seemed that in Scotland, at any rate, they had moved adversely owing to an epidemic of influenza in the early part of the year. But the position was not so bad as it appeared from the figures he had just quoted. The infantile mortality increase seemed to have been due largely to epidemics of various kinds, and the death-rate, which was 132 in the first quarter of the year under review, was 109 in the current quarter of this year. That at any rate was an encouraging figure.

He did not think that they would have the healthiest year on record, but he hoped that the figures would not be so severe as they were in the previous year. The adult sickness was from 15 to 20 per cent. up. That held good in England as well as in Scotland. The vital statistics moved in the wrong direction, also in France and in Denmark, so that, oddly enough, a wave of ill-health had passed over Western Europe. The returns moved seriously against them in Scotland, something like 1·5; to a lesser extent in England, something like 0·6; to a slightly lesser extent in France, about 0·3; and in Denmark something like 0·1. Some people said that the cause of this simultaneous movement of the vital statistics in the wrong direction all over Western Europe was the sunless summer. He did not know. Certainly the expense of drugs went up tremendously in Scotland—to over 25 per cent.; it went up to £40,000 above the average requirements of the preceding four years, and what that was due to he did not know. The Board were making a grant in respect of measles, an increased grant for pneumonia and bronchitis, and investigations were being made into the cause of infective jaundice, which caused considerable anxiety among the mining population in the East of Scotland. The organism of infective jaundice had been discovered, and the circulars sent out calling attention to it had resulted in the diagnosis as due to this infective jaundice of several conditions which were previously put down to some state of ill-health following influenza. Oddly enough, the same thing appeared in dogs, where the jaundice following an infection by this organism was apparently paralleled by a similar infection which had previously been put down to a post-distemper infection. Apparently it was a disease of rats, to which dogs were also subject, as well as human beings, and it was not merely an industrial disease, but one of which there were a certain number of cases among the rank and file of the population. They had made it notifiable in Scotland.

The difficulty in discussing Scottish vital statistics was that they could not get the people fully to understand how enormously important they were to the life of the community. The declining population of France, for instance, was not due to the low birth-rate but to the high death-rate. The death-rate in France was 17·3, as against something in the nature of 12 for England and Wales. The real policy was determined by the medical officers of health and the other people who worked out the amount of the new population who were going to survive. If the French gave up making 75 mm. guns and took to buying drain-pipes from Paisley they would be a much more formidable nation than at present.

Dr. DRUMMOND SHIELS asked if the Scottish Board of Health had given any consideration to the introduction of the Spahlinger treatment for tuberculosis. With some other medical Members of the House he had seen a number of cases treated with the new serum and vaccine last week in London and he was very much impressed with them. He knew there were difficulties in the way at present, but he would ask Captain Elliot to encourage his department to coöperate with the Ministry of Health in endeavouring to get some method by which this treatment could be given to sufferers. He did not think they should wait until the treatment was finally and absolutely guaranteed. As regarded the forms of tuberculosis other than pulmonary, he asked Captain Elliot to encourage the treatment of heliotherapy. He thought that the light treatment of tuberculosis was going to be very important, especially in surgical tuberculosis, which included practically all other forms than those associated with the lungs. Light treatment was proving very effective in the City Hospital in Edinburgh. Lupus or tuberculosis of the skin was a very terrible form of disease which very often affected young women most frequently in the face, and if it was not checked it created tragedy which was much worse than death. The Board of Health would do a very useful work in encouraging local authorities to see that the light treatment of this terrible disease was encouraged.

Recently in Edinburgh 403 samples of milk were taken, and 33 of them, or 8·1 per cent., contained live tubercle bacilli; the figures in other towns were very similar. The tuberculosis officer for Edinburgh gave figures in 1922 showing that of all the gland cases 30 per cent. were due to bovine tubercle, 18 per cent. of all meningeal cases, 50 per cent. of all abdominal tuberculosis cases, 58 per cent. of cases of tuberculous bones and joints, and 50 per cent. of lupus cases were due to the bovine bacillus which was practically always transmitted through milk. He was glad that the Board had realised its importance, and he urged that they should bring in at the very earliest moment the Tuberculosis Order of 1914. He wished to ask if anything had been done to carry out the recommendations of the local authorities received in a deputation in 1923 with a view to giving those authorities more power to deal with venereal disease. In the year ending May, 1923, the total attendances at the clinics in Scotland were 289,945, involving 22,800 people. These did not, of course, cover all the cases.

The hon. Member also called attention to the cases of ophthalmia neonatorum. It was disappointing to find in the weekly health returns that these cases were frequently occurring. It was well known that they need not occur. The treatment for prevention was extremely simple, and in many cases on the birth of a child this prophylactic treatment was given in institutions and by private practitioners. A great proportion of the cases of blindness in this country was due to this disease and it was very desirable when it was entirely preventable that the Board should be a little more stringent, and see that it did not appear in the weekly health statistics. Between 30 and 40 per cent. of the cases of infantile mortality were due to premature birth and congenital debility. That was nearly always due to the condition of the mother. These causes were the most important of the causes of infantile mortality and the condition of the mother before the child was born was thus of fundamental importance. In many towns of Scotland child welfare centres and antenatal centres were not properly accommodated. He thought the Board should give a little more attention to this matter. They had refused to extend

these centres in many cases. With regard to the nutrition of school-children in 1923, 16,200 children were officially certified as having a state of nutrition below the average, and 600 were certified as having very poor nutrition.

Captain ELLIOT, replying to the debate, said that the Board of Health had two officers investigating treatment by light at present. They would do their best to see that this most fascinating and stimulating subject was fully explored, and the full advantage taken of it for Scotland.

The debate was adjourned.

TUESDAY, APRIL 7TH.

Pay and Pensions of R.A.M.C. Officers.

Sir PHILIP RICHARDSON asked the Secretary of State for War whether he was aware that, after allowing for income tax and the increased cost of living, the pay and pensions of medical officers, and particularly those in India, were smaller in purchasing power than in 1914; whether he was aware that this was the cause of the falling off in the number of entrants to the Royal Army Medical Corps; and whether he proposed to recommend adequate increases.—Sir L. WORTHINGTON-EVANS replied: The falling off in the number of candidates for the Royal Army Medical Corps is due to several causes with which I could not deal within the limits of a Parliamentary answer. I hope that it will be possible to find a remedy without undue delay.

Chemical Warfare Experiments.

Mr. AMMON asked the Secretary of State for War if the 188 soldiers subjected to poison-gas experiments at the chemical warfare research department since 1918 included officers; and what were the number of officers and men, respectively, subjected to such experiments.—Sir L. WORTHINGTON-EVANS replied: The answer to the first part of the question is in the negative. The total number of officers and men of the navy and army subjected to the tests during the period in question is: Officers, 317; other ranks, 207.

Medical Re-examination of Pensioners.

Mr. HAYES asked the Minister of Pensions whether, in those cases considered for final awards and not found suitable and who were given an award for one year until further instructions, it was intended that they should draw the present pension without re-boarding unless the pensioner submitted a claim for increase of pension on the ground of deterioration.—Lieut.-Colonel G. F. STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: It is the policy of my right hon. friend, as it was also that of his predecessor, to reduce to a minimum the frequent medical re-examination of pensioners who have been on the pension list for four years or more, and the award referred to was designed to extend the period of review in cases where a final award could not be made. Cases will be liable to review with due regard to the nature of the disability and other factors, and while a substantial number of them will probably not be again examined by a medical board, except in the circumstances stated, others will, if it is thought advisable, be re-examined by a board at suitable intervals.

Milk for Mothers and Young Children.

Mr. W. C. ROBINSON asked the Minister of Health what local authorities were now providing milk for mothers and young children.—Sir KINGSLEY WOOD replied: According to the information in my right hon. friend's department, this service is now provided by 426 local authorities in England and Wales.

Maternity and Child Welfare.

Colonel DAY asked the Minister of Health if there were any boroughs or counties that had made no provision for maternity and child welfare; and, if so, would he give the names of the boroughs and counties, and say what action he proposed to take for their introduction.—Mr. N. CHAMBERLAIN replied: The answer to the first part of the question is that provision for maternity and child welfare may be made either by the county council or by the local sanitary authority, and such provision has been made for every sanitary district in England and Wales. The last part of the question, therefore, does not arise.

Morphine, Heroin, and Codeine Manufacture.

Colonel DAY asked the Home Secretary how much opium was purchased by factories in Great Britain during the year 1924; how much morphine; how much heroin; how much codeine was manufactured by the manufacturers in Great Britain during 1924; and how much of each of these narcotics was sent abroad.—Sir W. JOYNSON-HICKS replied: The compilation of the statistics for 1924 is not yet completed and I am able at the present moment to give only the figures of manufacture asked for, which must be regarded as provisional. They are as follows: Morphine, 99,400 oz.; heroin, 16,700 oz.; and codeine, 153,300 oz.

WEDNESDAY, APRIL 8TH.

MENTAL DEFICIENCY (AMENDMENT) BILL.

The Mental Deficiency (Amendment) Bill was read a second time.

This measure, which has been introduced by Sir LESLIE SCOTT, and is backed by Mr. FISHER, Sir HENRY SLESSER, Lieut.-Colonel FREMANTLE, and Mr. HERALD HURST, amends Section 7 of the Mental Deficiency Act, 1913, for the purpose of enabling a defective to be removed from an institution in order to be placed under guardianship. In the Memorandum attached to the Bill it is explained that some defectives after prolonged residence in institutions improve sufficiently to permit of their being sent out of the institution if some arrangements are available for providing care and supervision for them outside. The existing law does not allow of transfer from an institution to guardianship, but only from guardianship to an institution. If it is desired to transfer a case from an institution to guardianship it is at present necessary to discharge the patient and to take all the proceedings necessary to obtain a new order. These proceedings are cumbrous and expensive. Sir LESLIE SCOTT's Bill provides that the same machinery which is available for transferring cases from guardianship to institutions shall be available for the reverse process.

Venereal Disease Grants.

Major-General Sir JOHN DAVIDSON asked the Minister of Health if an annual grant of money was made to the National Council for Combating Venereal Diseases; if so, what was the amount; whether any return was made to the Ministry showing in detail how it was expended; and if such return was available for public information.—Mr. N. CHAMBERLAIN replied: The reply to the first and third parts of the question is in the affirmative. As regards the second part, the amount of the grant varies from year to year and was £9183 for the last financial year. As regards the last part of the question, details of the expenditure of the grants are shown in the annual reports published by the National Council.

Pay of Women in Civil Service.

Mr. TREVELYAN THOMSON asked the Home Secretary how many women in his department were performing the same work as men and receiving equal pay; how many were performing the same work and not receiving equal pay; and what was the reason for the differentiation.—Sir WILLIAM JOYNSON-HICKS replied: One medical inspector of factories receives the same rate of pay as the men performing the same duties. There are 39 other women employed by the Home Office in grades open to men and women whose remuneration follows the general principles already enunciated by the Financial Secretary to the Treasury. In the case of 14 women factory inspectors, the scale for women is identical with that for men so far as regards the lowest grade in the inspectorate.

THURSDAY, APRIL 9TH.

Charges Against Pensions Officials.

Sir WILFRED SUGDEN asked the Minister of Pensions whether he had inquired into the statement made on Feb. 17th in that House by the hon. and gallant Member for Salford West, to the effect that the assessors in the North-Western Region were required by the regional awards officer to reduce a certain number of pensions weekly; that if they affirmed or, in some cases, increased the assessment the regional awards officer sent for them and inquired why they had not produced the regular quota of reductions; and, if he had made such an inquiry, what was the result of his investigations.—Major G. C. TRYON replied: I have made careful inquiry into this allegation and am satisfied that there is no foundation whatever for it. The hon. and gallant Member for Salford (Mr. Hugh Morrison) has given me no assistance, but I have had full reports from the Regional Director, the Commissioner of Medical Services, the Regional Awarding Officer, and the Medical Assessors, all of whom deny the charge absolutely. I need scarcely add that any such practice would be entirely contrary to all instructions, and indeed impossible under the existing organisation of the Regional Office.

Pensioners and Treatment Allowances.

Colonel DAY asked the Minister of Pensions whether, seeing that under the rules of the Ministry a man suffering from attributable disabilities which disabled him from work was not entitled to treatment allowance, unless the treatment prescribed by the Ministry was of such a character as actually to prevent him from obtaining work, and in view of the fact that a man certified by his panel doctor or by a hospital board to be incapable of work was thereby rendered incapable of obtaining work, and at the same time was receiving no treatment allowance, he would take steps to remove what appeared to be a great hardship to ex-Service men.—Major TRYON replied: I would remind the hon. and gallant Member that (as was stated in reply to a similar question

on July 28th last) the conditions governing the grant of allowances under Article 6 of the Warrant are not identical with those which determine certification for the purpose of sickness benefit under the National Health Insurance Acts. Allowances under the Warrant are not, therefore, necessarily also payable in all cases, because sickness benefit is obtained. I am not, therefore, in a position to accept the hon. Member's suggestion.

The Development of Garden Cities.

Mr. FENBY asked the Minister of Health whether, in view of the ascertained facts that garden cities had now passed the experimental stage and was a profitable investment of public money, that they relieved congestion of population and traffic, took manufactures and workshops into the country, supplied houses for all classes, showed satisfactory health statistics, stimulated agriculture, horticulture, and market gardening and allotments, created new markets, and developed mentally and physically a vigorous and contented population, he would take steps to appoint garden city commissioners with powers to raise capital, acquire sites, issue loans, and in all possible ways facilitate the establishment of garden cities.—Sir H. BARNSTON (Comptroller of the Household) replied: My right hon. friend has every sympathy with the development of estates on garden city lines, and is watching with interest the progress which is being made; but in his opinion further experience is necessary before considering the establishment of special machinery such as the hon. Member suggests.

Salary of Pensions Department Medical Officers.

Colonel Sir ARTHUR HOLBROOK asked the Minister of Pensions whether the increase of salary of £50 per annum to be given to full-time medical officers of the Ministry whose services were being retained was in lieu of bonus or gratuity; and, if not so granted, would he explain why it was granted, seeing that the work had been and was steadily diminishing in comparison with that of the past five or six years.—Major TRYON replied: The increase in question is not of the nature either of a bonus or a gratuity, but is part of a general revision of the rates of remuneration of the administrative medical staff of the Ministry. In regard to the last part of the question, I would point out that while the work of the Ministry as a whole has diminished, the staff has also been reduced to a corresponding extent, and the work and responsibilities of individual officers remain as great as before.

Widows and Orphans in England and Wales.

Colonel DAY asked the Minister of Health the number of widows in England and Wales; and, if possible, the number of fatherless children and orphans under 14 years of age, respectively.—Mr. N. CHAMBERLAIN replied: For England and Wales the desired figures according to the 1921 Census were as follows:—

—	Widows.	Children under 14 years.		
		Father dead.	Mother dead.	Both parents dead.
England	1,528,093	613,531	208,581	43,548
Wales and Monmouth	93,665	41,224	20,615	3,297
Total	1,621,758	654,755	229,196	46,845

White Lead Poisoning.

On the motion for the adjournment of the House for the Easter Recess until April 28th,

Mr. RHYS DAVIES raised the question of the attitude of the Government to the International Labour Conventions. He said that the growth of the number of cases of lead poisoning was rather disturbing. In 1922 there were 246 cases and 26 deaths; in 1923, 327 cases and 25 deaths; and in 1924, 486 cases and 32 deaths. The Labour Party desired to see a Bill introduced entirely prohibiting the use of white lead in paint. He asked that the question of anthrax should not be dropped, and that steps should be taken to appoint Dominion delegates so that this subject might be raised on behalf of the Empire at Geneva.

Sir W. JOYNSON-HICKS, Home Secretary, said there were great difficulties in dealing with the question of white lead, as there were two schools of thought, one which desired to prohibit its use altogether, and the other which wanted to regulate it. He hoped to bring in a Bill, which was already in draft, directly after Easter, and that agreement would be reached among the users and the manufacturers of white lead so that he would be able to make regulations. These regulations would deal with the present methods of painting buildings and prohibit the use of white lead except in the form of paste and paint ready for use. They would also deal with the danger arising from the rubbing down or scraping of old paint, and prohibit altogether, or modify, the periods during which young persons might work with white lead. He would give the House this further undertaking that if experience of the working of the regulations proved that they did not carry out what was hoped, and did not enormously diminish the illness and deaths that arose from the use of white lead, he would come to the House and ask for further powers. As to the danger of anthrax arising from imported wool, the Government disinfecting station at Liverpool was doing good work in minimising the danger. The Government were anxious to have it established that all wool should be disinfected before it came to this country. But the Geneva Conference would not pass such a proposal, and it rejected by 50 votes to 41 a motion by Mr. Rhys Davies himself to have the question raised again by placing it on the agenda of this year's meeting. The Empire was not unanimous. The Government were willing to try to get the Empire to agree, but the hon. gentleman knew the difficulties.

Sir A. STEEL-MAITLAND, Minister of Labour, said that the reason why the Maternity Convention had not been ratified was that it was generally considered that the position of married women in this country under the National Health Insurance Acts was different from that provided in the Convention, and on the whole secured them as favourable conditions.

Medical News.

UNIVERSITY OF LONDON: SENATORIAL ELECTION.—The nominations for Representatives of Convocation on the Senate of the University have now gone in, and in the Faculty of Medicine Dr. Graham Little, the Member of Parliament for the University, is opposed by Mr. T. B. Layton, who stands with the support of the Twentieth Century Society of London Graduates. Dr. Graham Little being the President of the University of London Graduates Association, the election may be presumed to be a trial of strength between the two bodies, the main point at issue being the adoption or rejection of the Haldane Report.

Three lectures on Recent Advances in the Study of Living Cells will be given at King's College, Strand, London, W.C., by Prof. Robert Chambers, professor of microscopic anatomy in Cornell University, New York, on April 27th, 28th, and 29th, at 5.30 P.M. Admission to these lectures is free.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At the recent dental examinations, just concluded, out of 26 candidates entered the following 13 passed the Final Professional Examination and were granted the diploma L.D.S. R.C.S. Edin.:—

David Lumsden, Thomas D. Gould, Douglas B. Cruickshank, Annie M. Stephen, Temple F. M. Gibson, John W. Swan, Peter Adair, Edward P. Tait, John Shearer, James McK. Proctor, Norman G. Imlach, John D. Cooper, and Robert J. Snodgrass.

The following candidates passed in the subjects of—

Pathology.—Esmee K. Wilson, Pieter F. Zuidmeer, and Walter E. Phillips.

Medicine and Surgery.—Esmee K. Wilson, Guthrie Russell, and Mela R. Soni.

Dental Subjects.—John Baker.

UNIVERSITY OF ABERDEEN.—At the graduation ceremony held recently, degrees in medicine were conferred on the following successful candidates:—

DOCTOR OF MEDICINE.

Martin M. Cruickshank (in absentia) (awarded honours for thesis), Richard R. Trail (awarded commendation for thesis), John MacLennan (old regulations), and Alexande Mitchell.

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

With Second-class Honours.—*Charles S. D. Don, *William A. Mair, *James A. R. Paterson, and Donald S. Stewart.

Ordinary Degree.—*Philip Bayer, Henry C. Bonney, William Booth, Leon Chanock, *Alexander Cruickshank, Ronald A. Cumming, John M. Davidson, Gilbert M. Davis, Charles A. Dean, Jessie R. G. Dingwall, Albert T. Duncan, George N. Duthie, Margaret M. Gair, Alexander Galloway, James A. Gordon, John D. Gordon, Thomas R. Gordon, Janet Johnston, William Kelly, David B. Laing, John MacArthur, *Patrick D. A. MacDonald, Kenneth C. MacKenzie, Donald N. MacKinnon, Frank S. McLean, Anne G. I. MacLennan, George W. Mearns, Lewis Morgan, James A. Mulligan, Norman M. Munro, Oswald G. Prosser, William J. Raitt, William P. E. Richards, James Robertson, *Maurice C. G. Robertson, Albert A. Simpson, *John T. Sorley, William R. Soutter, Barbara W. Spark, John I. Taylor, Hector M. Walker, James D. Walker, *Richard W. H. Welsh, Adam D. F. White, Alexander H. Wilson, Charlotte M. Wilson, and Douglas E. Wilson.

* Completed Final Medical Professional Examination with distinction.

DIPLOMA IN PUBLIC HEALTH.

Agnes M. E. Benzie, John C. Kerrin, Christina R. Laing, John C. Milne, Lily M. Watt, and Mabel Wilson.

HUNTERIAN SOCIETY.—The annual general meeting of this society has unavoidably been postponed, and will now take place on May 11th, at Simpson's Restaurant, Cheapside, London.

THE Royal Academy of Sciences of Copenhagen has nominated Prof. E. H. Starling, Foulerton Research Professor of the Royal Society, a foreign member of the Physiology Class.

ROYAL INSTITUTION.—A general meeting of the members of the Royal Institution was held on April 6th when the special thanks of the members were returned to Sir Humphry Davy Rolleston for a gift of a large number of letters from Sir Humphry Davy.

FREEMASONS HOSPITAL AND NURSING HOME.—The following have been appointed as members of the honorary consulting staff: Dr. Newton Pitt, Sir James Purves-Stewart, Mr. A. Baldwin, Mr. Ernest Clarke, Sir James Dundas-Grant, Mr. T. H. Openshaw, Sir D'Arcy Power, and Mr. Percy Sargent. Sir D'Arcy Power has been appointed chairman of the Medical Advisory Committee of the Institution.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting of the Faculty, held on April 6th, Drs. James P. Brown, Arthur C. L. La Frenais, and Thomas M. Newton were admitted, after examination, as Fellows of the Faculty.—At the same meeting the Faculty elected Dr. James A. Adams as their representative on the General Medical Council for the period of five years.

UNIVERSITY OF BIRMINGHAM.—A three months' course of post-graduate demonstrations will be given at the General Hospital, Birmingham, on Tuesdays, and at the Queen's Hospital, Birmingham, on Fridays, from 3.30 to 5 P.M., commencing on April 21st. The course will include demonstrations on medical and surgical cases, skin diseases, ophthalmic cases, children's diseases, urinary diseases, insulin treatment, &c. Further information may be obtained from the Clerk to Clinical Board, University, Edmund-street, Birmingham.

TAVISTOCK CLINIC.—A course of ten lectures on the Treatment of Functional Nerve Disease will be given at the Tavistock Clinic for Functional Nerve Cases by Dr. H. Crichton-Miller, Dr. S. Roodhouse Gloyne, and Dr. J. R. Rees, on Tuesdays, at 5.30 P.M., beginning May 5th. A syllabus of the lectures and further details may be obtained from the hon. lecture secretary at the clinic, 51, Tavistock-square, London, W.C. 1.

BRITISH EMPIRE CANCER CAMPAIGN.—The following grants have been made: £2500 to the Cancer Research Department of the Cancer Hospital (Free); £3000 for cancer research purposes to the Middlesex Hospital; £400 to St. Mark's Hospital, City-road, for further cancer investigations; £500 to Dr. Thomas Lumsden, of the Lister Institute, for original cancer research; £300 to Dr. Malcolm Donaldson to facilitate research into certain forms of inoperable cancer; £1695 to St. Bartholomew's Hospital for the formation and maintenance of a special radiology research department into cancer; and £1400 (additional) to the Middlesex Hospital for similar purposes, subject to the confirmation of the Radiology Committee of the Medical Research Council. These sums are additional to grants in furtherance of cancer research of £6480 made during the current financial year and are exclusive of the sum of £5000 for radium for the use of various institutions and organisations.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting was held at the Miller General Hospital, Greenwich, on April 3rd, with Dr. H. S. Knight, the President, in the chair, when an address and demonstration on Anæsthetics for Operations in the Region of the Mouth and Nose was delivered by Mr. E. Stanley Rowbotham, of the Sidcup War Hospital. The speaker described the method by which two catheters were used for intubation of the larynx, one for insufflation into the trachea, and the other, the larger, for expiration. The catheters were tied together and passed as far as the bifurcation of the trachea. A free airway and absence of septic lung trouble resulted. The supply of the air current might be provided by a cylinder of compressed gas, an electric motor, or bellows. The anæsthetic vapour required to be warmed as it passed direct to the lungs. An anæsthetic was first given in the ordinary way, then the direct laryngoscope was used and the tubes were passed. For the nasal passage an adrenalin spray was used. Double intubation was necessary for mouth and tongue operations. Chloroform had to be used in diathermy operations in order to avoid the risk of an explosion. The lecturer then demonstrated the mechanism of the different pieces of apparatus.

MEDICAL HYDROLOGY.—Under the auspices of the Committee for the Study of Medical Hydrology in England, a course of lectures and demonstrations will be held in the Senate room of the University of London, from April 27th to 30th. Lectures will be given by Dr. J. C. Thresh on Types of Water, Mr. Dewey on Hydro-geology, Prof. J. Barcroft on the Capillary Circulation of the Skin, Lr. Fortescue Fox on Heat in the Treatment of Disease, Dr. J. B. Burt on Disorders of Digestion, Dr. V. M. Coates on Arthritis, and Dr. Rupert Collins on Neurasthenia, followed by a visit to Buxton. Those proposing to be present at the lectures or at Buxton are asked to notify the hon. secretary, Hydrology Committee, University of London, South Kensington, S.W. 7.

THE LATE DR. C. W. HAYWARD.—Charles Williams Hayward, M.D. Edin., D.P.H. Camb., died on April 3rd, at Meigle, Perthshire, aged 60. He was born at Vernon House, Mount Vernon-road, Liverpool, and was the son of the late Dr. John W. Hayward, of Liverpool. He joined his father in practice there soon after qualifying M.B., C.M. at the University of Edinburgh in 1886. He studied at the University of Edinburgh and Vienna, and became M.R.C.S. and L.R.C.P. London in 1888. In 1889, at the University of Edinburgh, his thesis for M.D. was considered worthy of commendation. A man of singularly varied acquirements and great versatility, he was physician, musician, playwright, politician, and a barrister-at-law of Gray's Inn. He was called to the Bar in 1898, but did not practise. His father was an ardent Liberal and Dr. Hayward carried on the political traditions in support of that party in Liverpool. In 1914 he was selected by the Liberals to stand for the Eddisbury Division, but was not elected to Parliament. He was an enthusiastic supporter of the National Insurance Act. Besides some contributions to medical literature, he was the author of two plays dealing with Rome of the classical era, and collaborated in writing a musical comedy. He was an honorary physician of the Liverpool Hahnemann Hospital. His remains were cremated at Glasgow on April 7th.

THE LATE DR. J. DULBERG.—Joseph Dulberg, M.D. Würzburg, who was born in Roumania 63 years ago, was a well-known figure in Manchester medical circles, more especially amongst the Jewish community, where his activities were manifold. Two years ago his health broke down and he retired to Southport, where he died on April 8th in his sixty-fourth year. He left Roumania when a young man, went to Berlin, where he studied law, graduating as Doctor of Law in 1882. He then went to Manchester, where his father had established himself in business, and studied medicine at Owens College. He completed his medical studies at Würzburg, where he graduated M.D. in 1891, and having obtained the L.S.A. in 1892 began practice in Manchester. Dr. Dulberg was one of the founders of the Jewish Hospital in Manchester, of which he was an honorary physician. He acquired an intimate knowledge of hospital work when a resident assistant physician at the Julius-Spital in Würzburg. Dr. Dulberg was a prolific writer on medical subjects. In 1905 he translated Senator and Kaminer's book in two large volumes on "Health and Disease in Relation to Marriage and the Married State," besides writing on "Personal and Family History in Relation to Life Insurance," "Continental Spas," and "Sterile Marriages." In 1915 he volunteered for military service and was in charge of the Seaforth Military Hospital, and afterwards of the Neurasthenic Hospital at Brinnington, near Stockport, and was prominent in the territorial movement promoted by Israel Zangwill. He took a keen interest in psycho-therapeutics. He was a J.P. of the city of Manchester and a magistrate for over 16 years.

Appointments.

DONALD, H. G., M.B., Ch.B. Aberd., has been appointed Medical Officer of Health, Auckland Rural District Council.

FRASER, J., M.D., Ch.M., F.R.C.S. Edin., Professor of Clinical Surgery in the University of Edinburgh.

PARROTT, A. H., M.D.S. Birm., L.D.S. R.C.S. Eng., Lecturer in Dental Materia Medica and Therapeutics at the University of Birmingham.

SMITH, H. G., M.D. Lond., D.P.H., Medical Officer of Health, School Medical Officer, and Police Surgeon, Lincoln.

TAYLOR, A. L., M.B., Ch.B., F.R.C.P. Edin., Senior Assistant Medical Officer at the County Mental Hospital, Burntwood, Lichfield.

Royal Alexandra Infirmary, Paisley: CALDWELL, J., M.B., Ch.B. Glasg., Resident House Physician; POLLOCK, A. M., M.B., Ch.B. Glasg., GILLIES, D. R., M.B., Ch.B. St. And., Resident House Surgeons.

Vacancies.

For further information refer to the advertisement columns.

Barnet, Wellhouse Hospital.—Res. M.O. £350.
Birmingham and Midland Homœopathic Hospital and Dispensary.—Res. H.S. £175.
Brighton, Sussex Throat and Ear Hospital.—Hon. Clin. Asst.
Bury Infirmary.—Hon. Ophth. S.
Cairo School of Medicine.—Asst. Prof. of Chemistry. L.E.720.
Canterbury, Kent and Canterbury Hospital.—Third Res. M.O. £125.
City of London Hospital for Diseases of the Heart, &c., Victoria Park, E.—H.P. at rate of £100.
Colchester, Essex County Hospital.—Asst. H.S. and Reg. £150.
Dartford, Kent, City of London Mental Hospital.—Med. Supt. £1250.
Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. at rate of £150.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Res. M.O. £200. Also H.P. at rate of £125. Also Morning Cas. O. at rate of £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. at rate of £120.
Holland County Council, Lincolnshire.—Asst. County M.O. £600.
Leeds Public Dispensary.—Jun. Res. M.O. £150.
London Lock Hospital, 91, Dean-street, W.—Tempy. Hon. S. to Out-patients.
Manchester County Mental Hospital, Prestwich.—Locum Tenens. 8 guineas weekly.
Nottingham, Bagthorpe Institution and Infirmary.—Res. Asst. M.O. at rate of £300.
Plymouth County Borough.—Asst. M.O.H. £750.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Asst. S.
Rochester, St. Bartholomew's Hospital.—Third Res. M.O. at rate of £200.
Rochford Hospital.—Asst. Res. M.O. £125.
Royal College of Surgeons of England.—Examiners in Anatomy, Dental Surgery, &c.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Reg. at rate of £100.
Sheffield Royal Infirmary.—Surg. Reg. £200. H.S. £80. Also Dental S.
Sutton, Surrey. Downs Hospital for Children.—Asst. M.O. £550.
Westmorland Sanatorium, Meathop, Grange-over-Sands.—Res. Asst. M.O. £350.
Whittingham County Mental Hospital, Preston, Lancs.—Two Tempy. M.O's. Each £7 7s. weekly.
Winchester, Royal Hampshire County Hospital.—H.S. £150.
Winsley Sanatorium, near Bath.—Asst. Res. M.O. £250.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Cromer, Norfolk; Higham Ferrers, Northants; Sandy, Beds; Silverton, Devon; Lanchester, Durham; Overton, Flint.

Births, Marriages, and Deaths.

BIRTHS.

LYSTER.—On April 4th, at Great Baddow, Essex, the wife of Ronald Guy Lyster, M.B., B.S., of a son.
MCMORLAND.—On April 3rd, at Brookfield, Colyton, Devon, the wife of Dr. J. Bruce McMorland, of a son.

MARRIAGES.

BRIDGES—LUARD.—On March 31st, at St. Leonard's Church, Lexden, Colchester, Major Robert Francis Bridges, R.A.M.C., to Charlotte Lucy Chauncy, second daughter of the late Edward Chauncy Luard, and of Mrs. Luard, of Holly Lodge, Colchester.
ELLIOTT—RICHARDS.—On April 4th, at St. Paul's, Hampstead, London, Charles C. Elliott, D.S.C., M.D., M.R.C.S., of Seaford, Sussex, to Lorna Richards, M.B., Ch.B., second daughter of the late Mr. C. Hooper Richards and Mrs. Richards, of Birmingham.
RAINER—BOULTON.—On April 4th, at St. Paul's Church, Herne Hill, S.E. 24, Charles Farrell Rainer, M.R.C.S., L.R.C.P., eldest son of the late Charles Oliver Rainer, of Georgetown, Demerara, British Guiana, and of Mrs. Alice Maud Rainer, Upper Norwood, London, to Kathleen May, widow of the late Raymond Wright Boulton, R.F.A.

DEATHS.

EAGER.—On April 8th, at Perryn-road, East Acton, Thomas Cawley Eager, M.R.C.S., L.R.C.P., late of Woking, in his 80th year.
PRICHARD.—On April 8th, after an operation, Evan Christopher Prichard, M.D., of Horse Fair, Banbury, aged 47.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

BERKSHIRE HOSPITALS.—Princess Mary last week opened a new nurses' home at the Royal Berkshire Hospital, Reading, which will accommodate a staff of 89 nurses. The Royal Berkshire and Associated Hospitals Aid Committee now has a membership of more than 100,000, and last year 57 per cent. of the patients treated at the Reading institution were contributors to the scheme. Of the £19,000 collected n 1924, £12,000 came from the country districts.

Notes, Comments, and Abstracts.

THE DUTIES OF MEDICAL OFFICERS OF HEALTH.

THE more important functions, both general and specific, of medical officers of health in England and Wales are summarised in a memorandum[1] just issued from the Ministry of Health. Those to whom it is primarily addressed will for the most part be familiar with its contents, but will appreciate the convenience of possessing a concise pamphlet which amplifies Article 14 of the Sanitary Officers Order, 1922 (*a*), where the duties of the medical officer of health are specified with extreme brevity. An index to the statutes, orders, and regulations relating to the powers and duties of medical officers of health is arranged alphabetically in an appendix, so that the M.O.H. will find no difficulty in gaining further information as to his duties and rights. Doctors in private practice do not always realise how extensive are these duties and rights and occasionally resent as officious interference an investigation into the circumstances of cases of infectious disease or of tuberculosis, or active encouragement of local welfare centres. It is to practitioners, therefore, that we commend the study of this pamphlet.

HEALTH HINTS FOR SCHOOL-CHILDREN.

THE Borough of Hornsey is to be congratulated on a useful method of propaganda in regard to the prevention of disease. A little book with the title "Health Hints for School-Children," written by Lr. A. T. Nankivell, the school medical officer, has been distributed in all the public elementary, secondary, and private schools in Hornsey, and gives in clear language hygienic counsel in regard to teeth, dirt and disease, drains, the dust-bin, exercise, fresh air, food values, eyesight and sleep, with notes on the danger of flies and how to seek municipal advice where sanitary house defects or infectious diseases are in question. The illustrations are simple and good, and the lessons, if taken to heart by a school population, would certainly promote the public health.

VENTILATION AND HUMIDIFICATION IN COTTON MILLS IN INDIA.

THE subject of ventilation and humidification in cotton mills has been under discussion for many years, as it was found that in most mills the necessity for the employment of artificial humidification has proved a serious obstacle to improvements of conditions. In 1921 the Government of India instituted a special inquiry which was entrusted to Mr. T. Maloney, *M.C.*, A.M.C.T., who was instructed (1) to obtain accurate observations regarding the method of humidification and ventilation employed in cotton mills and their effect on working conditions, and (2) to evolve recommendations designed to effect a marked amelioration in conditions without serious detriment to the industry.

After about 18 months spent in the inquiry Mr. Maloney has presented his report, and his general conclusion was that "while it has not been definitely proved that health is materially affected in every case, it is significant that the physique of the average cotton operative is much lower than that of workers of similar castes and wage-earning capacity in other trades, and that weight decreases after a few months' continuous service." Mr. Maloney suggests the use of the kata-thermometer for measuring the cooling power of the air, and the standard of cooling power as measured by the wet kata cooling power should be 11 (milli-calories per sq. cm.) at head level. Although a considerably higher standard would be advantageous, as a result of his observations Mr. Maloney considers that this standard would prevent danger to health and serious discomfort among the operatives, and generally a vast improvement in existing conditions. In some centres like Madras the proposed standard is already exceeded for most of the year, and little difficulty would be met with in conforming to the standard continuously, but, in other areas, like Ahmedabad and Bombay, the cooling power seldom remains above the standard for the whole day, and often fails to attain it at any time in the course of the day. It is proposed to allow a period of two years to enable them to introduce adaptations and arrangements necessary for producing the required standard of cooling. The report also proposes (*a*) the provision of an adequate number of hygrometers in departments where humidity is likely to be excessive, and (*b*) the maintenance of humidity registers containing records of the wet and dry bulb tempera-

[1] Memorandum on the Duties of Medical Officers of Health in England and Wales (other than the Medical Officer of Health of the London County Council and Medical Officers of Health of Portand Riparian Sanitary Authorities). 1925. H.M. Stationery Office Pp. 22. 2*d*.

tures. It is further suggested that where steam is used for the purpose of artificial humidification, its introduction should cease when the dry bulb temperature of the room exceeds 85° F. Factory inspectors are to be empowered to insist on the adoption of methods designed to reduce temperature and particularly to place restrictions on the methods of construction in the case of new mills. For existing mills it is suggested that inspectors should be able to insist on white-washing of roofs or of spraying them with water when temperatures are excessive.

The Government of India are apparently inclined to support the proposals made in Mr. Maloney's report, and it may be anticipated that some, if not all, of the suggestions made will be introduced within the next year or two.

"SCIENCE, CRIME, AND CHRISTIANITY."

UNDER this title a sermon was delivered by Mr. Arthur R. L. Gardner at the Church of St. Martin-in-the-Fields, London, on Jan. 20th, the anniversary of the death of John Howard, the Prison Reformer, who was born in 1790; the Howard League for Penal Reform, 18, Savoy-street, London, W.C. 2, has now published the sermon in pamphlet form (2*d.*). Mr. Gardner outlines the progress of scientific thinking since pre-Victorian days, and recognising the tendency to mental inertia, points out "Our danger in this country . . . is not that Science will be impeded in her advance, but that she will advance in every other country except ours." He believes that the first step in removing the conditions which engender criminality is to inquire into the whole system of established thinking about God and human nature, and he quotes Dr. Hamblin Smith, the medical officer of H.M. Prison at Birmingham, that there are abnormal mental conditions, not yet recognised by the law, which are potent factors in the production of crime. From the standpoint of the Church, the author of the sermon says scientific penal reform means the disappearance of the Puritan doctrine of the State punishment of wickedness and vice and all the untold misery that it has caused. He does not turn away from the question Pilate asked, but gives as the answer, "The mind of Science incarnate on earth, revealing the true mind of God to the world, in order to save it from all the self-inflicted misery of centuries upon centuries of wrong thinking about God and Human Nature."

WILLIAM LYNN, JOHN HUNTER'S FRIEND.

Hunterian orators at the Royal College of Surgeons of England have for many years shown great ingenuity in saying something new about John Hunter, and certainly Sir D'Arcy Power's Oration presented the master in a new way. John Hunter had not before, that we can remember, been presented through the medium of reminiscence, and the circle of his friends and pupils, who survived into the nineteenth century, were singularly dumb. In fact, Jesse Foot's libels are more detailed than their eulogies. That William Lynn should have left no record of Hunter has always seemed surprising. He was one of the chief of Hunter's associates and assisted him in the formation of his museum, but he left no account of his master and our knowledge of himself is fragmentary. At the time of his death in 1837 THE LANCET described only his last day on earth, and the "Dictionary of National Biography" appears silent.

William Lynn was born in 1755, and at the time of his death was almost the last survivor of the personal friends of John Hunter. We are tempted to believe from what little we know of him that he preserved much of the Hunterian manner. Barnard Holt, F.R.C.S., writing in 1861, records a quaint pronunciation used by him. "*Nater*, gentlemen, *Nater* cures the disease," he would exclaim during lectures "in his eccentric way," when referring to the *vis medicatrix naturæ* and the Hunterian belief therein. Can it be that an old pronunciation lingered on here from another and more famous speaker's lips? Lynn was not apparently an illiterate and was not therefore guilty of a Cockneyism. We prefer to think that he remembered a Scotticism. He seems to have been better known as an operator than as an author, but in 1786 he published in elegant enough English a short tract, previously read by him to the Royal Society, entitled "The Singular Case of a Lady who had the Small-pox during Pregnancy; and who communicated the Same Disease to the Fœtus." The pamphlet is based largely on a previous case described by John Hunter. As an operating surgeon Lynn was famous, and we read how in 1796 it was the custom of groups of students from the united hospitals of Guy's and St. Thomas's to visit in turn the other hospitals of London, there to witness the operations of Sir James Earle, William Blizard, and Lynn. Thomas Martin, one of the original 300 Fellows of the Royal College of Surgeons, was among these migratory visitants. He saw Lynn at work at the Westminster Hospital, but his descriptions of these "masterly operations" died with him. Silence settles on the memory of William Lynn till 1837, when THE LANCET informed its readers that he died suddenly whilst getting into his carriage at a quarter to two in the afternoon of June 24th. He had just been calling on a relation near Bloomsbury-square and was returning to his house at Clapham. He was in the best of spirits, "and stated, when allusion was made to the recent decease of his late Majesty [William IV.], that he well recollected the death of George II." (THE LANCET, 1836-37, vol. ii.) His pleasant portrait, reminiscent of Mr. Pickwick, by J. Ward, is still at the Royal College of Surgeons in Lincoln's Inn-fields, but it cannot tell us what the living original knew of his famous friend, John Hunter.

HEALTH CONDITIONS IN BRUNEI.

Mr. E. E. F. Pretty, the British resident in this native State, situated on the north-west coast of Borneo, has issued a report for the year 1923, from which it appears that the death-rate was roughly 40 per mille and the birth-rate 52·4 per mille as far as the figures available show. The total European population at the end of the year was 35, and their health was good. Malaria was less prevalent than in 1922. The percentage of school-children showing splenic enlargement fell from 18·39 to 13·04. The medical officer states, in regard to ankylostomiasis, that the indications received of this disease did not show any great difference from those of the previous year, but until a proper campaign is undertaken, with routine and exhaustive examination, it will be impossible to estimate the prevalence of the infection. It must be borne in mind that the main native population live actually in huts erected over a tidal river, and the dejecta of more than three-quarters of the population are passed straight into the river. There is thus not an urgent necessity to undertake a proper survey of this infection in Brunei. Almost the same remarks apply in regard to amœbic dysentery, of which very few cases are seen. Pulmonary tuberculosis is fairly prevalent in the State, but it is almost impossible to get the natives to come for treatment. Judging from the cases of people suffering from other diseases who are seen by the medical officer, and in whom pulmonary tuberculosis is found on examination, it may be estimated that at least 3 per cent. of the general population are harbouring active tubercle bacilli in their lungs. The total number of vaccinations done in the State was 812, as against 442 in 1922. This increase is due to vaccinations amongst Kedayans who previously had refused to be vaccinated. The Brunei Malays do not like their children to be vaccinated until they are over 1 year old. Vaccination is not at present compulsory. The Brunei native is very conservative in the matter of health and treatment for ill-health. He is extremely reluctant to be seen by a European medical man, and when seen he is still more reluctant to take the treatment prescribed. His prejudice against admission to hospital is so deeply rooted as to make him rather lose his life than enter. This applies in still greater force, if possible, to his female relatives. There is no hospital in Brunei. Those requiring hospital treatment, and willing to submit to it (chiefly Government servants and prisoners), are taken to Labuan Hospital, to which the Brunei Government pays a small annual subscription. The rubber estates almost entirely employ the Brunei Malays as their labourers, and these, as already stated, object to treatment by a European medical man. There is no system of night-soil sanitation in Brunei; even the Asiatic population living on the banks of the river use latrines which are built over the river, and the dejecta are taken away by the tide. There were no epidemics of infectious or contagious disease in 1923. Dr. T. C. A. Claverton, the medical officer at Labuan, acted in the same capacity in Brunei, paying altogether 17 visits of varying duration. He has won the confidence of the natives to a remarkable degree. The Brunei dispensary, in charge of Dresser Leong Ah Ng, treated a total of 2249 patients during the year. The area of the State of Brunei, which was placed under British protection in 1888, is about 4000 square miles, and the population is estimated at about 30,000, chiefly Malays and Borneans. The mean temperature in the shade in 1923 was 80·73° F., and the rainfall, as registered at seven stations, ranged from 99·26 inches to 164·94 inches for the year.

PUBLIC HEALTH IN THE STRAITS SETTLEMENTS.

A REPORT for the year 1923, prepared by the Colonial Secretary, has recently been issued. The colony consists of the island of Singapore (with its dependencies), Penang (including Province Wellesley and the Dindings), Malacca, the Cocos or Keeling Islands, Christmas Island, and Labuan. The estimated population of Singapore is 457,571, of Penang 310,781, and of Malacca 160,886. The crude birth-rate for the year was 30·43, and the crude death-rate 27·80 per mille, the latter being the lowest on record. Deaths from

pneumonia were 1710 and from influenza 162. Beri-beri accounted for 904 deaths, as against 1388 and 1299 in 1922 and 1921 respectively. Malaria and tuberculosis were responsible for 3430 and 2683 deaths respectively, fever unclassified for 3064, dysentery for 839, and diarrhœa for 411. There were 18 deaths from cerebro-spinal meningitis, 56 from plague, and 3 from small-pox, but none from cholera. The prevalence of venereal disease in Singapore has given cause for grave anxiety, and a small committee was appointed to consider and report on the question. The report, which was presented in July, disclosed a very disquieting state of affairs, and measures to remedy this are receiving the careful and anxious consideration of Government. The climate of the Settlements varies but little during the year. The mean temperature in Singapore for 1923 was 80·80° F.; in Penang 81·9°; and in Malacca 82·00°. There are no well-marked rainy and dry seasons, the rainfall being pretty equally distributed throughout the year.

THE LATE DR. OSCAR JENNINGS.

IT is impossible to get ahead of a catchy statement once it has become widely circulated; we still receive communications referring to a dictum of the late Dr. Oscar Jennings that every fourth doctor is a drug habitué. Oscar Jennings was a clever and eccentric man who lived most of his professional life in New Zealand and Paris, though he died at Ramsgate just after the opening of the war. This accounts for the absence of his name from the Medical Register to-day, which has been noted critically in some of the commentaries upon his words. His statement was, of course, absolute rubbish, but, looking at the connexion in which it was made, it is probable that he, obsessed though he was with the prevalence of morphinism, did not say what he meant to say. In his clientèle in Paris there was a very large proportion of medical men, some neurologists, and most of those interested in occult sciences and folk-lore. Hence it was generally assumed, at the time when he wrote his frequently quoted words, that he was making a thoughtless deduction from the entries in his case-book at a particular moment, when he was struck by the high percentage of medical men among those consulting him as drug addicts. Dr. Jennings's general conclusions on morphinism were not taken altogether seriously though his clinical experience was large, nor was he a scientific neurologist, although he translated into French certain neurological classics and was medical electrician in a Paris hospital. His wide acquaintance in Paris was largely due to his interesting personality, and especially to his energy in recommending the use of the bicycle and tricycle to both sexes as the readiest method of obtaining hygienic exercise at a time, nearly 40 years ago, when cycling was not a part of the daily life of a large proportion of the population.

A REGRETTABLE INEXACTITUDE.

To the Editor of THE LANCET.

SIR,—As a member of the London Panel Committee, I hope you will forgive me for protesting, with such restraint of my indignation as I can effect, against the gross inexactitude, and resulting libel, embodied in your principal leading article of April 4th. In the course of that article, rightly criticising the high-handed activity of the Ministry of Health, you—not once, but five times—accuse the Panel Committee for the County of London of having formulated an unjustified charge against one of their fellow practitioners, and as having been rightly condemned therefor by the Inquiry Committee set up to consider the case. The number of the references negatives one's first assumption that a slip of the pen explained the libel. One is therefore driven to the conclusion that the writing of this article was deputed to a member of your staff so unfamiliar with the various statutory bodies concerned with the regulation of medical practice as to be unaware that the Panel Committee and the Insurance Committee for the County of London are two distinct entities, of utterly different composition and utterly differing functions. Needless to say, it is the latter body that alone was concerned in this unfortunate prosecution.

I trust you will—as I am sure you will—give to this correction the same publicity that you gave to the regrettable mis-statement complained of.

I am, Sir, yours faithfully,

63, Harford-street, E., April 8th, 1925. HARRY ROBERTS.

*** The cases referred to in our article have been brought by the Insurance Acts Committee to the notice of the Royal Commission on National Health Insurance, and further comment would be unprofitable at this stage. The Insurance Committee for the County of London was the body which made the representations to the Ministry of Health, when the Inquiry Committee was appointed for an investigation of the circumstances, as stated in our leading article. Dr. Roberts is wrong in assuming that a slip of the pen does not account for a description of the situation which must have been perfectly clear to most of our readers. It should have been explained that the connexion of the Panel Committee could be only slight, through members of that Committee finding a place on the Medical Service Subcommittee of the Insurance Committee. We are sorry to have to endorse Dr. Roberts's title that we have committed "a regrettable inexactitude," but when he uses the word libel, we cannot see that any individuals have been accused of anything wrong; the whole purpose of the article was to show that a situation had arisen that merited Departmental attention.

The following is a paragraph additional to the Memorandum of Evidence to be submitted by the British Medical Association to the Royal Commission; a digest of the Memorandum will be found in our issue of Jan. 10th, p. 95.

"There have recently been a number of cases in which the action of the Ministry of Health in imposing penalties on practitioners has appeared to the Association to be of an inexplicable character, and has given rise in the minds of many practitioners to a feeling of injustice, or even of a suspicion of vindictiveness. The Association recognises the administrative duties of the Ministry in this connexion, and is very anxious to foster in the profession a feeling of confidence in the exercise by the Ministry of its judicial or quasi-judicial functions associated therewith. When, however, agreements with the profession have been reached with regard to the machinery and procedure by which decisions shall be arrived at, it is exceedingly disquieting to find that, though the machinery is used and the procedure followed, there are cases in which there seems little or no relationship between the decisions of the Ministry and the reports or recommendations of the bodies on which action is supposed to depend."—ED. L.

A DANGEROUS DEVICE.

A CORRESPONDENT sends us a specimen of a sponge cut into the shape of a cylinder with rounded ends, approximately 2½ in. long and ¾ in. in diameter, which is designed for insertion into the vagina during menstruation, as a substitute for the use of a sanitary towel. It is enclosed in a net and one end is covered by a rubber cap. The instructions for use include a "note for unmarried women" wherein they are informed "when the presence of the hymen is probable, the insertion of a sponge should not be attempted except under qualified advice." The disadvantages and dangers of this device will be apparent to our readers and we call attention to it only because the (unsupported) statement is made that it has been approved by doctors.

CHRONIC ULCERATIVE STOMATITIS.

To the Editor of THE LANCET.

SIR,—May I, through the medium of your columns, seek the experience of others in the prevention of chronic ulcerative stomatitis. My patient, a moderately active young man of temperate habits, has been the victim of ulcers of his tongue, cheeks, and gums during the past five years. He had attacks of indigestion formerly, but has been free from these now for some considerable time. The ulcers continue to appear one, to three, or four, at a time for a period of several weeks; he is then free for a while, only for another crop to appear later. The patient keeps to a wholesome but not a strict dietary, and although the ulcers disappear rapidly under applications of sanitas, potassium chlorate, and silver nitrate, I am unable to prevent their recurrence. I am, Sir, yours faithfully,

Herne Hill, S.E., April 7th, 1925. GUY MEADOWS.

ROYAL VICTORIA HOSPITAL, BELFAST: ANNUAL REPORT.

THE annual report for 1924 showed a large increase in the volume of work in all departments. The financial statement showed an income of £53,914 and an expenditure of £54,424. The subscriptions from the working classes, which are one of the principal sources of income of the hospital, were fully maintained in spite of the existing industrial depression, and amounted to £20,000. The new dental department continues to grow and there are now 25 dental students. Details are given regarding the extensions of the hospital now in course of erection. These will include 80 additional beds, a new block for nurses, additions to the out-patient departments, larger accommodation for the eye, ear, and throat department, the venereal department, the dental department, and the X ray department, three new operating theatres, and a new mortuary. These extensions have been in progress for nearly two years, and it is expected that they will be completed in a few months. They will make a substantial addition to the resources of the hospital, the pressure upon whose accommodation is severe and always steadily increasing. The waiting-list exceeds 300. The total cost of these extensions is estimated at £120,000.